MASTER
BOOK I

MASTER BOOK ONE

{*Complement to* MASTER SCROLL A}

Beginning the Use of Tools *and* Materials

BY
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and
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with
Manual Projects by ~ ROSS L. WINSHIP

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BESS BRUCE CLEAVELAND
and others including many children

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MASTER BOOK I
Complement to MASTER SCROLL A
THE CHAUTAUQUA-FOUNDATION
EQUIPMENT

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The Chautauqua Equipment

An instrument of Creative Activity

TO PARENTS

Creative activity is the keynote of the many attempts now being made to improve and enrich educational practice from the time children leave the cradle until each finds his own or her own work in the world. Observant parents have long recognized this force at work in the home day by day and year by year, through the successive stages of each child's development.

Those are wonderful years, those years at the beginning of life, when all is new and the world about us lies waiting for discovery and exploration. They are the years in which we make our first acquaintance with the forms and properties of inanimate things, and with the fundamental needs and relationships of living creatures. They are the years in which we look on Nature and her wonders with reverent, astonished eyes, the years in which we take for granted and as mere matter of course, the most intricate and modern of all man-made inventions. They are the years in which we first discover and employ with awkward, eager hands, the simple, basic tools by means of which man's civilization has been wrought. In that early period of life it is our privilege frankly to accept the work of the grown up world, the world of men and things, at the face value it presents to us, to look open-eyed with admiration at the workers whose task is obviously fundamental to the life of society, and be free from warping considerations of reward or place. Surrounded with the manifold wonders of a new universe whose facts we seek to know, to understand, to make our own possession, we feel the need of active *doing* in those years, of active *experiencing* so far as that is in our power.

Hence those universal desires on the part of children first of all to manipulate, then to construct, to draw and otherwise to represent the things they see. For they are under a necessity to express themselves, not in mere words, but in dramatic, imitative play, and through the use of plastic materials as well. Therefore, indoors and out, by means of this spontaneous, imaginative games, by means of blocks, wood, paper, and pencil, clay or anything in fact, that they can mold and shape to meet this all-absorbing purpose, we find them reconstructing, re-creating, and rehearsing the experiences met with in a constantly unfolding and expanding world. *Creative Activity* whatever it may come to mean in after life, whether its drive leads to understanding and control of materials, as is true in fields of industry and art, to understanding and control of natural forces, as in the various professional and scientific fields, or to the understanding and control of men, as in administrative and governmental relations, Creative Activity, the basis of success and satisfaction in every avenue of human endeavor, resolves itself in its beginnings to this early impulse of childhood, this hunger to make, construct and represent, the better to understand, appropriate, enjoy.

Master Book I and Master Scroll A, together with the equipment that they supplement, the Chautauqua Desk, its Table, Bench and Hy-San Crayons, have been devised as aids to children in their first experiences with the materials and tools that serve the ends of this creative impulse. In the Source Pictures of the Scroll and in the pages of the Master Book, will be found suggestions drawn from the authors' own experiences, and from activities successfully employed by numerous other workers in the educational field. Book and Scroll together offer to the child and to the grownup members of his family, a comprehensive survey of the possibilities for interesting and profitable experiences that lie within his powers of achievement. They afford a variety of answers to the question so often raised in every home, "What can we do now?" At the same time they present a set of standards in the light of which that question must ever be considered, if it is to be answered successfully, answered in the light of what it really is—an educational opportunity of the highest possible importance. The adult reader who looks through the following pages with this thought in mind, will note these facts about the various suggestions given. *They are* *worth while from the child's standpoint.* To the great majority of children both the process and the resulting product will appear desirable for their own sake. And this is a necessity if suggestions are to bear fruit in self-initiated, self-directed undertakings—"projects" as they are called by educators today.

But while they make appeal to immediate interest, the suggestions given do more. They lead interest into channels that definitely invite to further effort and further investigation. Project must lead to project if the ends of self-education are to be served.

At the same time the problems presented are type problems, the mastery of which will enable a child to master others among the endless variety that constantly confront him in his efforts to gain a knowledge of his world.

They are of a kind that introduce him to the use of the simple materials and tools that are basic to our civilization and to the work of the modern world.

Incidentally he will acquire numerous fundamental ideas of the principles, techniques and standards that govern their use.

He will also be given an understanding of many of the occupations and vocations fundamental to modern life.

In following projects of the kind suggested through to successful achievement, certain habits invaluable in later life are definitely fostered. For materials hitherto wasted and destroyed as useless about the home, begin to serve precious economies and definite uses and purposes in creative effort. Tools become the best of playthings in the hands even of small children. Books and pictures begin to serve new uses and purposes. They become aids in the accomplishment of one's ends, instead of vehicles for passive diversion or instruction, and stress is placed throughout the Master Book on the necessity for inventiveness, for adaptation, and the adjustment of the plans submitted to the materials and resources at hand.

Not the least in importance must be reckoned the habit of achievement itself. The projects described have purposely been made simple, especially in the earlier portions of the Scroll and Book, where the abilities of children under eight years of age have been kept especially in mind. The projects attempted by children under eight should be executed very simply, crudely in fact, but carried through to completion in the manner characteristic of their efforts, that is to say, with speed and enthusiasm. Later on, more careful workmanship is possible, and undertakings demanding certain developments of technique and skill are presented in the later portions of the material. For the child of eight and ten years old needs to be stimulated and satisfied in his desire to do the thing he undertakes in an increasingly serious and workmanlike fashion.

It is of little moment whether we call the Creative Activity of these early years by the name of "work" or by the name of "play." The fact of outstanding importance is that it be recognized as a means of education, rich in values for the child and for his future. Homes, rich and poor alike, should be aware of this. They should understand, too, that by making wise provision for its expression, by supplying the simple materials and tools required, and by encouraging the child's self-directed efforts in their use, they have it in their power to enrich and to increase those values. At the same time, through the stimulation of interest, creative activity can be guided into avenues that shall afford definite possibilities for individual self discovery, for character building and for life planning.

THE AUTHORS

Chicago
May, 1926

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In addition to suggestions received from many published studies dealing with the interests and abilities of children, and from the activities and projects developed in many progressive schools, the authors beg to acknowledge special indebtedness to the writings and research of the following educators;

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To Stella Knight Ruess, *who in addition to other friendly assistance has contributed Source Picture Number 18, "Tree Friends," together with illustrations and suggestions for the accompanying chapter in the Master Book, and has permitted the use in Chapter XVI of the humorous verses entitled "The Zoological Procession" by the late W. H. Knight.*

To A. Neely Hall, *for his valued criticism and helpful suggestions in connection with Source Picture Number 19 and the accompanying chapter, "With Hammer and Saw."*

COVER DESIGN

From the Statue by NELLIE V. WALKER

"HER SON" *is a simple but effective rendition of an old, old subject. The central feeling of this group is the adoring, protective love of the mother, who sits beside her boy looking up into his face. The boy is a slender, straight, graceful lad. The childlike contours of his face and body are beginning to change into the firmer lines of youth. There is an eagerness in his attitude; his eyes seem to be looking far ahead, gravely and earnestly. His right hand reaches forward a little, his left rests lightly in his mother's hand. She circles him with her arm, but there is no effort to hold him back. You read in her face the recognition of his dawning manhood, the longing to shelter and protect and hold him safe, even while she realizes that in the maturing of his character he must go forward independently.*

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CHAPTER I

Where the Children Live

THERE was once a little girl named Mary. One day she made a bed for her doll. She made it out of the lid of a small wooden box that her brother John had knocked to pieces with a hammer. For you see the idea had come to her, that she could add a head board and a foot board, and make it look just like a real bed. So she cut two pieces of cardboard and made them the shape she wanted. Then she found some tiny tacks called "curtain tacks." They were quite big enough to nail the cardboard head and foot to the ends of the piece of wood—and there was her bed, just as you see it in the picture on the next page, all ready for its mattress and pillows! (No. 3.)

"Why don't you paint it?" asked John when she showed it to him. Mary thought that a good plan. So what do you think she did next? Why she went to her Chautauqua Desk of course, and took out her Hy-San colors and a paint brush. In the drawer of her desk she found the lid of a mason jar that she kept there to use when she needed it. She put a little water into this, and then she pounded up some broken bits of white crayon with John's hammer. When they were quite fine she put them in the lid of the mason jar and left them for a while until they should get soft.

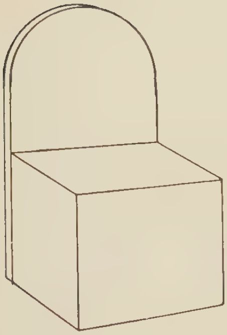
That is the way she made the paint for her bed.

But meanwhile John had been thinking. "Why don't we make some chairs, Mary?" he said. "I think we could make them out of some of those little blocks Baby Billy plays with. We could put backs on them just as you put the head and foot on your bed."

The blocks John thought of using had been given to Baby Billy by his young uncle. He had cut them himself in the carpenter shop at High School. There were ever so many of them, and they were all just the same size, about an inch each way. (No. 7.) John was right in thinking Billy would never miss a few of them, but he did remember to ask mother before he took them. He used one for the seat of each chair, cut a piece of cardboard the right height and width, rounded the top a little, and nailed it to the block with a single carpet tack. Then the chair was made, and ready to be painted. (Nos. 1, 2.)

But by the time he had made two chairs, John had thought of something else to do. "Mary," he asked, "Don't you want a dresser to go with your bed room set?" And of course Mary did. In the picture on page 3 you will see the dresser. It is made of six of Billy's little blocks tacked to a piece of cardboard. Each block looks as if it were a separate drawer, as you see, and is held in place by a carpet tack driven through the cardboard back. (Nos. 8, 9.)

"I have just the thing for a mirror," cried Mary, as she watched John hammer in the last tack. "It's a piece of silver paper. I've been keeping it for ever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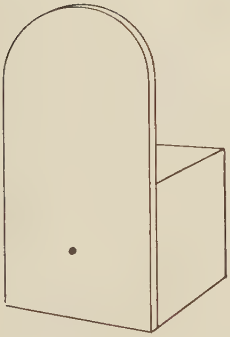
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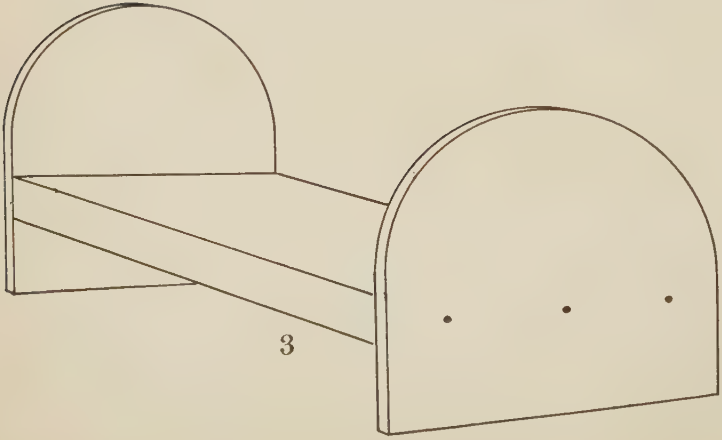
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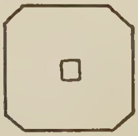
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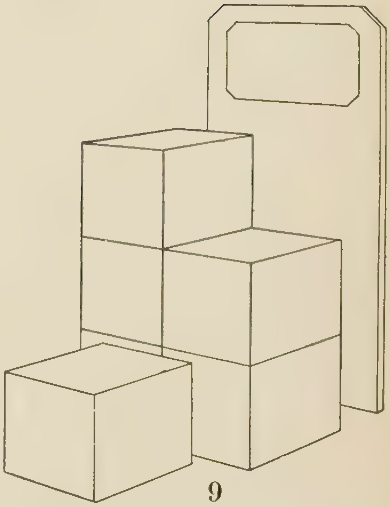
so long. I knew we should need it some day. We can paste it on, after we get the painting done."

Now this was the beginning of the house that you see in the first Source Picture of your Master Scroll A. It started with the little bed that Mary made and it grew and it grew. For when her paint was thick and creamy, Mary painted all the bed room furniture white. It took a great many coats of paint before she was satisfied with the way it looked. And then John made the little costumer you see in the picture from a stick of wood. (Nos. 4, 5, 6.) He used some very thin nails he called "brads" and a piece of cardboard that he bent at the corners. And by the time they had finished all these bed room things, a great idea had come to them. They would make a whole house and furnish it all themselves. And because so many other children love to make houses, and because John and Mary made a very interesting house, and invented some new kinds of furniture to put in it, this picture of it was made for your Master Scroll. And the drawings that you will find in this chapter were made as well. They show you how the house and its furniture were put together.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Now after they had been working on their house for a time, they gave it a name. They called it "Where the children live," because as John said, it was to be entirely a children's house with rooms in it where children could find all the things they need to find in a house, and where they could do all the things they need to do, indoors. And if you look at the Source

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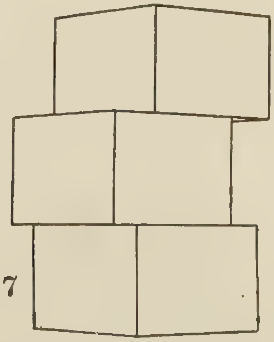
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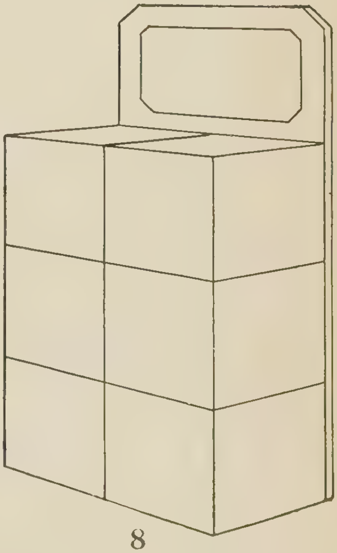
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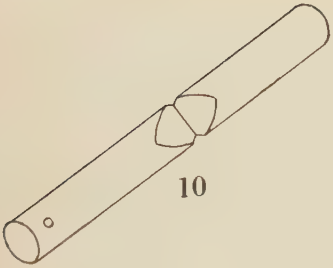

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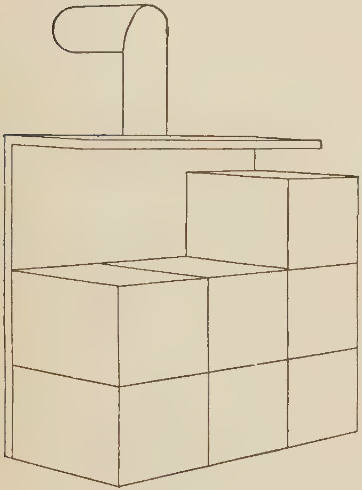
Picture and think about the different rooms, you will see that this is true. For there is a place in the house where you can sleep, a place where you can bathe and dress, a place where you can eat, and a place for work and play. In fact the house "Where the children live" is really a *home*. For when we say "home" we mean just that kind of a place, a place that belongs to you, just as the house belongs to the children, a place where you can do the things you need to do, a place where you can keep things that are yours, and be busy, and comfortable, and happy.



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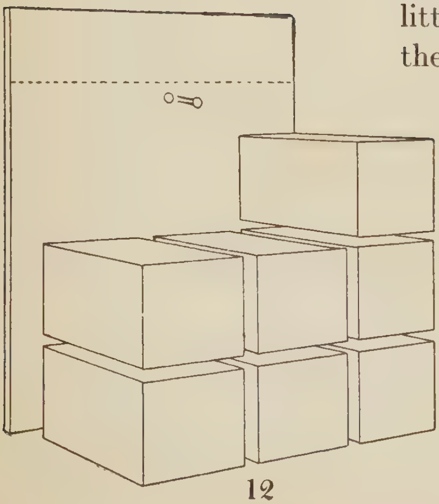
You will see there is a very nice kitchen "Where the children live." Perhaps they know how to do their own cooking. At any rate I think they must eat in the kitchen, as there are only four rooms in the house. The room for work and play is the largest one of all. Some people would call it "the living room," and I think you will agree that is a good name for it.

John and Mary used often to draw pictures of their house. "This is the way it looks on the outside," John would say. And he would go to the corner of the play room by the window, and sit down at the Chautauqua Desk and make a house in crayon on the green drawing board. He always put in the windows and doors, and a chimney, and perhaps some trees on either side. And Mary would draw plans of all the rooms, and show where she thought they ought to put the different pieces of furniture. You will see one of these little plans at the top of the Source Picture. And at the side you will see the kind of house John liked to



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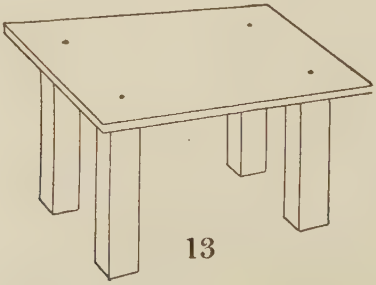

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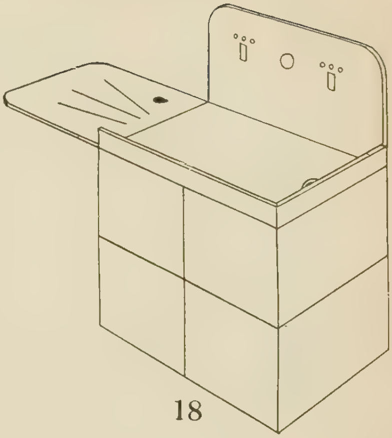
draw. Down in the lower corner on the other side there is a picture of the garage he said he was going to build some day, and I suppose that must be one of "the children" in front of it with the big dog. When you come to make your house, you can imagine the way it is going to look on the outside, and draw your own pictures of it, and make plans of it, too. On page 104 and page 108 you will find pictures of the house "Where the children live" that were drawn by two different people who wanted to show how they thought it ought to look on the outside. They are not much like the houses John drew. Which one of all do you like the best?

John and Mary made their house out of three wooden boxes of the kind that grocers nearly always have on hand. You can generally buy two or three of these for a few cents. Sometimes you will find just what you need in the attic or store room of your own home. On page 6 are some pictures that show just how the house "Where the children live" was put together. Pieces of corrugated paper were cut and nailed up in front to make the gable ends. The roof was made out of a great big piece of the same paper. It was nailed down to the corners and sides of the big upper box. Then strips of cardboard were marked and painted to look like bricks, and these were tacked at the sides to give a neat finish in front.

You will see, too, how a cardboard wall was fitted into the upper box to make a bath room, and how a door was made in it. The top of the door was made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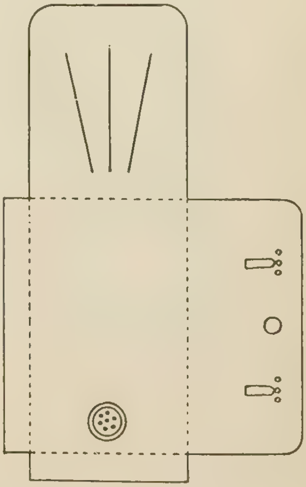
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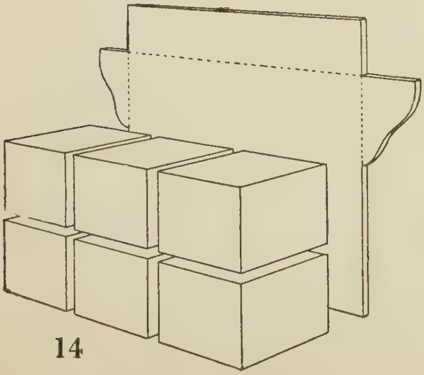
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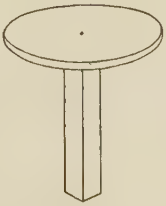
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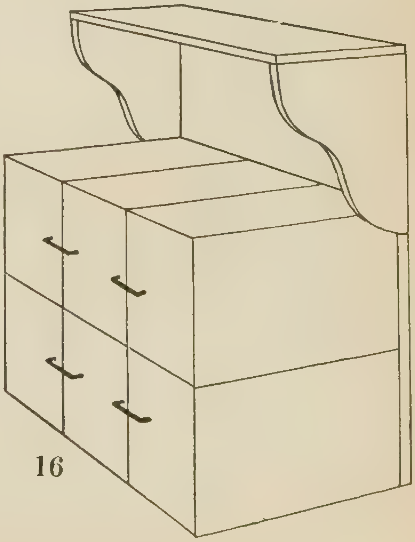
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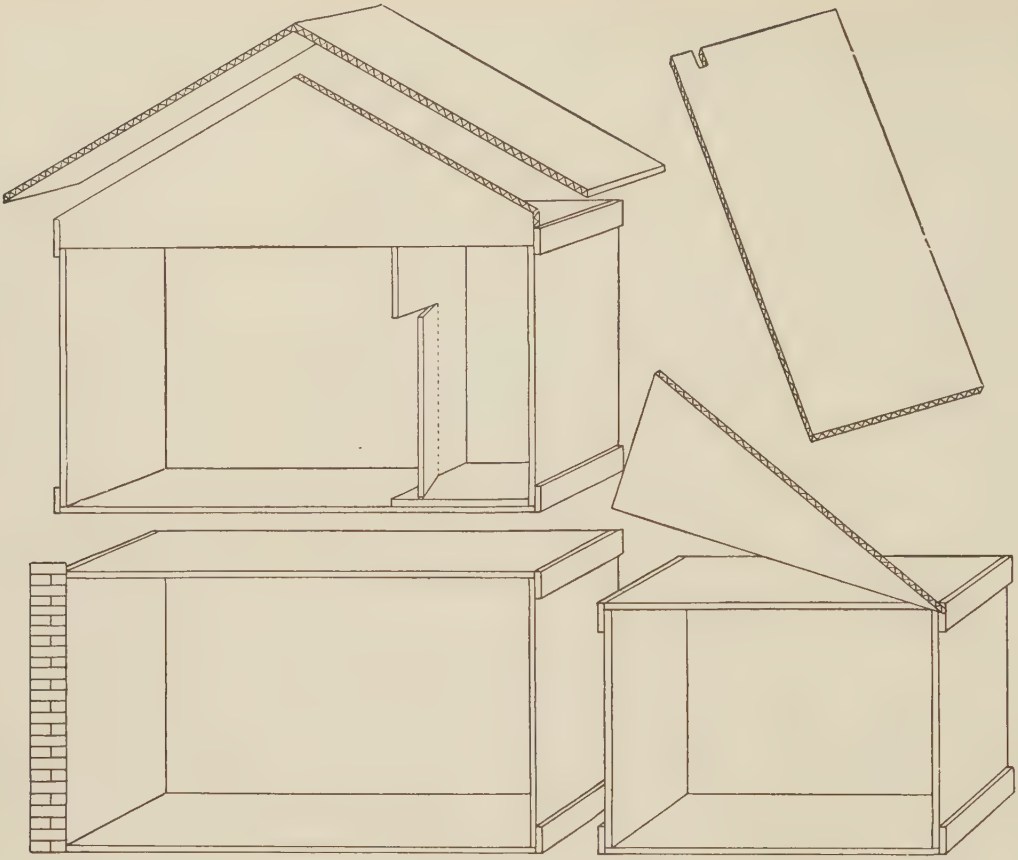
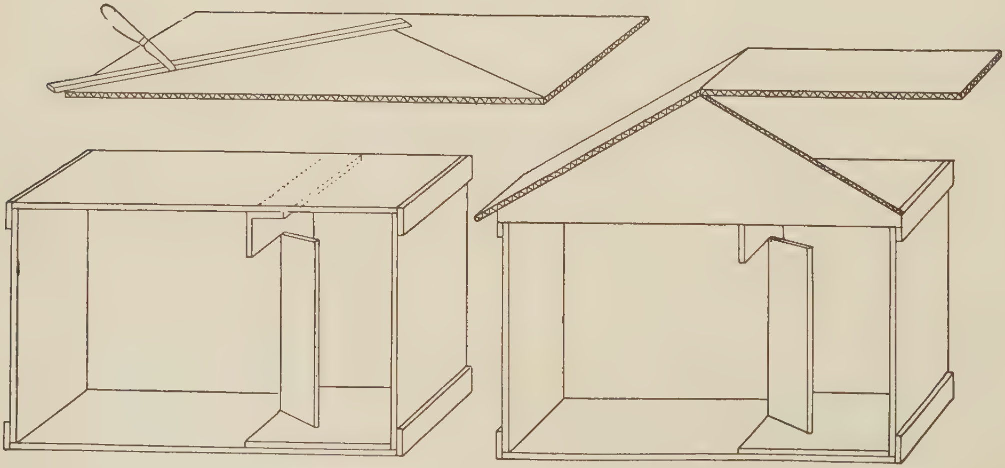
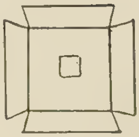




by a cut with the scissors. Then the door was bent back, and the bend in the cardboard made it stand open, as if it were on a hinge. The cardboard wall had to be made just the right size, and fitted very tightly to keep it straight and firm. The lower end was bent across and laid flat to make a floor for the bath room, and that helped to hold the wall in its place.

After the house had been put together in this way, the rooms were papered to cover up the rough wooden sides of the boxes. As you will see, John and Mary used some light blue paper for the walls of their bed room, a piece of yellow paper for the bath room, and a piece of gray paper for the kitchen walls. For the living room they used a big piece of tan colored wrapping paper. They cut a piece of it just the right size for each wall, and then they drew a border to go around the top.

When you make the wall paper for your house, you may think it a good plan to put a border in every room. And in one or two rooms you may decide to put a pattern all over your paper. On Source Picture Number 10 of your scroll you will find some border and "all-over" patterns. Two or three of them would make pretty wall paper and you can invent others. Source Picture Number 10 will show you, too, how you can measure spaces and put your patterns on evenly. It is a good plan to use very simple patterns for wall paper, and not to make the colors too bright. Choose paper that is rather light in weight. Stiff, heavy paper is not good for walls.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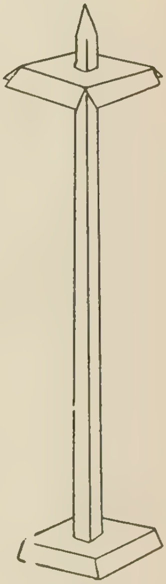
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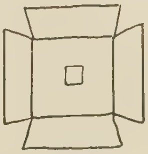
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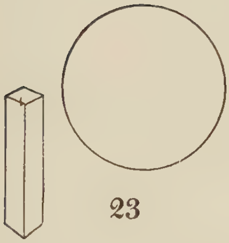
And now, perhaps, you are wondering just how to put on your paper, after you have measured it, and cut it, and drawn and colored the patterns for it. You put it on the wall in just the same way that the real paper hanger puts it on, when he papers the rooms in your own home. First you must make a flour and water paste. Put a heaping tablespoonful of flour in a saucepan and mix it with a little cold water, until you have a nice, thin cream without any lumps in it. Then pour in boiling water and keep it on the stove boiling hard for a few minutes. Stir it all the time. When it gets thick and begins to look like boiled starch, take it off the stove and let it cool. When cold it should be like a thin jelly and easy to spread on the back of your wall paper. It will keep for several days and, if it grows too stiff, you can always make it thinner by adding a little boiling water. Use a folded piece of clean cotton cloth to spread it on your paper, or, if you have it, a little flat brush like the one on the Source Picture above the paste pot. You will notice it is a good deal like the brushes the paper hanger uses, only so much smaller. If I were you, before beginning the papering, I would spread a newspaper over the top of my Hy-San table to protect it from the paste.



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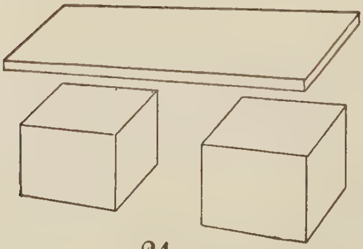
Paper the ceilings first with pieces of paper big enough to cover the corners and go down a little way on the walls. In that way you can be sure there will not be a gap between your ceiling paper and the paper on your side wall. It may take two or three



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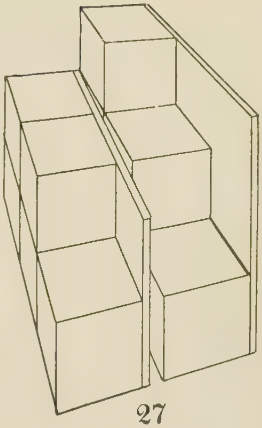
pieces of paper to cover the ceiling of a big room like the living room. If so, lap the edges a little, and try to keep them straight. If you look at the paper on the walls in your own home, you will see where the separate pieces end, and how they are lapped at the edges. Plain white paper is good for the ceilings, or wrapping paper a little lighter in color than the paper you use for your wall. Have you ever noticed that in real houses the ceilings are lighter than the walls? I wonder if you can tell why.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The strips of paper for your walls should be put on so that they just reach the ceiling. If there is a little extra length at the bottom it can be cut away afterwards, or covered up with your flooring. Getting the paper on the walls is an exciting business after the paste has been spread. You will need to hurry and get it on before the paper gets damp and soft. Have a big piece of soft cotton cloth ready and use it to pat the paper down firmly against the wooden sides of the box. Smooth out the wrinkles. A few will come in spite of every care that you may take.

For the floors of the house you might use a very heavy piece of wrapping paper, or the cover of a cardboard box. But perhaps nothing is quite so good as a piece of the dark brown blotting paper that comes in the large squares or "sheets" that are used on office desks. This makes a nice "hard wood" effect. In the living room you might use strips of it to make a baseboard. These can be pasted along the wall just above the floor. A small piece of oilcloth makes a fine

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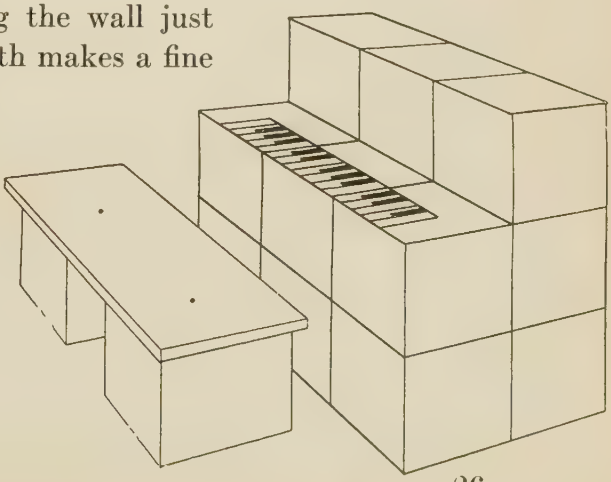
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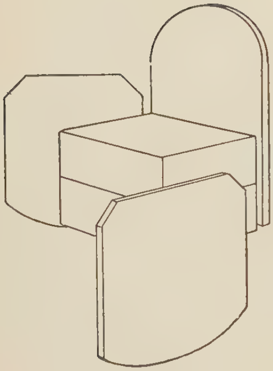
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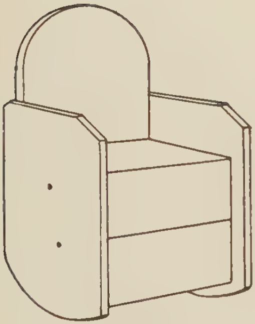
cover for the kitchen floor, and another could be used for the floor of the bathroom.

Of course it is not necessary to make the kind of furniture for your house that John and Mary made for theirs. But if you do, you will need to have a good many of the little blocks that are shown in the pictures, fifty or sixty of them in all. They are not perfect cubes as the pictures show, but they are better than cubes for making furniture, as they build up into more convenient shapes. In Chapter XIX you can find out just how they are made. They should be of soft wood so that nails can be driven into them easily. Notice the legs of the kitchen table, the row of bricks that make a shelf above the fireplace, and the radio box. When your blocks are being made you might ask to have a few pieces cut in that shape too.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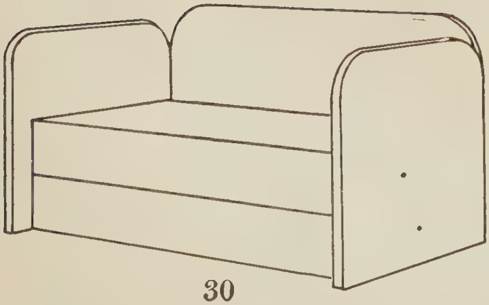
If you cannot get these blocks made for you, you will find the little inch cubes that are made for kindergartens will do very well. Seventy-five cents will buy a hundred of these. They are sold in the stores that keep kindergarten supplies. Get the unpainted kind and then you can color them to suit yourself and fit in with the color plan of the room you are furnishing.

The pictures in this chapter will show you nearly everything you need to know about the way John and Mary made their furniture. But there are a few little points that may not be perfectly clear, so let me tell you about them. The back and ends of the sofa in the living room are rolled slightly at the top to take away the stiff look they have when left perfectly straight.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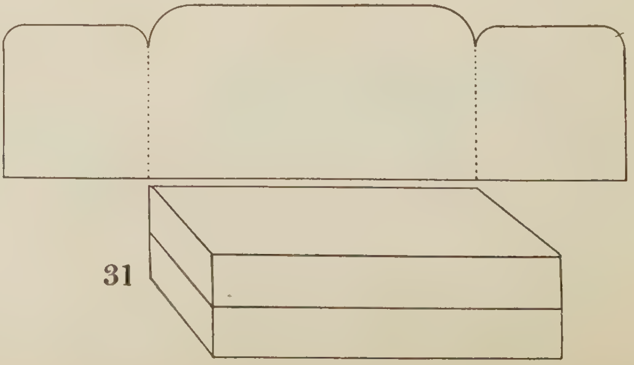
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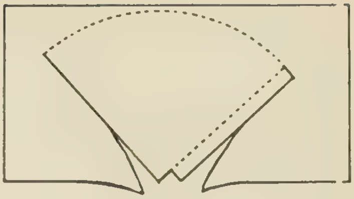

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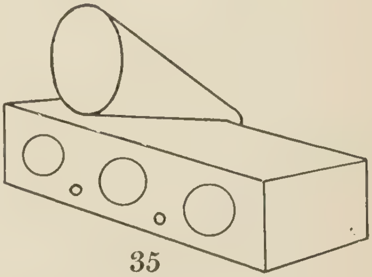

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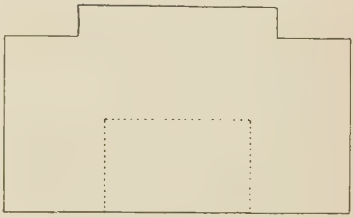
This little roll gives the sofa a comfortable look, and you know in our own homes we always try to make the living room a comfortable place. The dark brown in your color box will make a nice "mission" or "walnut" finish for your living room furniture. You can mix it with red if you like and imitate mahogany. The sofa and chairs can be painted to look as if they were upholstered. In the Source Picture you will see that John and Mary upholstered them in red. What color will you choose for yours I wonder. (Nos. 28, 29, 30, 31.)

Whatever the color of your furniture, you will probably want a brick fireplace. The Indian red that comes in the boxes of soft Hy-San crayons (No. 80) is just the right shade for this. Marking in the white outlines of the bricks is tiresome work, but the fireplace looks more real in the end. Paint them in with thick white paint on the point of your brush. Make the brick hearth out of a piece of cardboard, and paint the bricks inside the fireplace as well as on the outside. (Nos. 32, 33, 34.)



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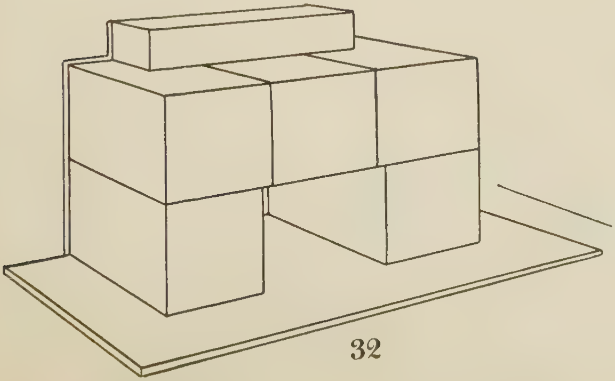
The radio horn will need some pasting where the edges of the paper come together. You might use a drop of glue for that. The horn is held in its place by a thumb tack put through the part that is bent under at the small end. The horn and box can be painted black and the dials drawn in white with the tip of your brush. (Nos. 35, 36.)

The piano keyboard is drawn on white paper. The black keys are made with pen and ink or with a soft black lead pencil. If you remember to draw first a



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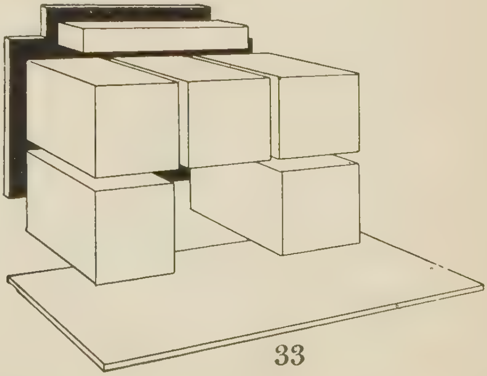

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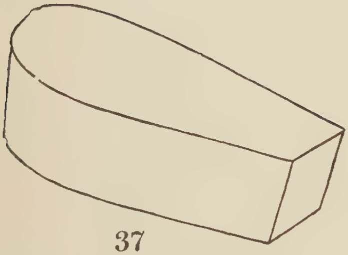
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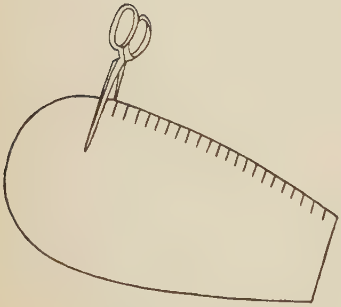
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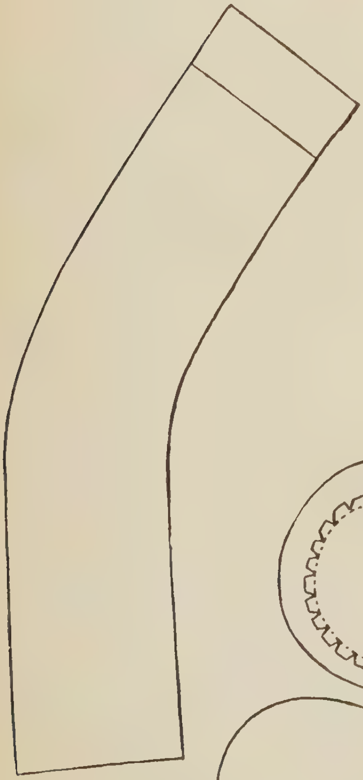
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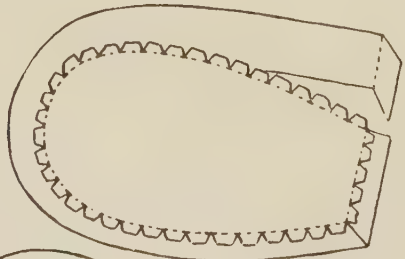
group of two, then a group of three, then a group of two black keys, they will look like a real piano. Paste the keyboard in its place. (Nos. 25, 26.)

The kitchen stovepipe is made from a roll of paper fastened together with glue at one end, and held together at the other by the brass paper clip that fastens it to the stove. A little slash underneath with the scissors makes it possible to bend the "arm" in place without flattening the pipe. It is painted black like the stove. (Nos. 10, 11, 12.)

The cardboard back of the kitchen cabinet is cut with wings at either side and a shelf at the top. These can be bent to stay in place if the cardboard is stiff, or glued together at the edges. Glue is better than paste or mucilage for this kind of work, but you must be careful to use only a drop and spread that over the part, or the edge that needs holding in place. The handles of the kitchen cabinet are made of double pointed tacks, "matting tacks" as some people call them. (Nos. 14, 16.)

The kitchen sink is made from stiff white paper. The faucets are drawn with a pencil, and a thumb tack driven through the bottom holds the sink in place on the blocks below. It looks as if it might be the drain pipe opening. You will see that the three lines drawn in the drain board make it look very real. Use paper that is stiff enough to keep in shape after the sides of the sink have been bent up. The drain board, too, can be bent to give it the right slant. (Nos. 17, 18.)

The furnishings of the bath room are made entirely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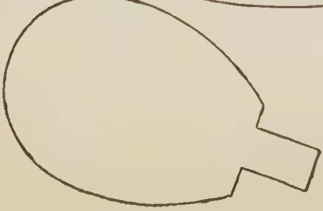
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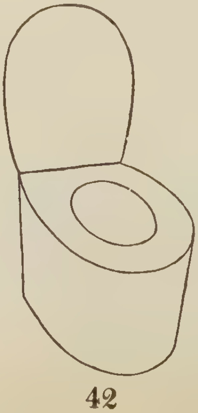
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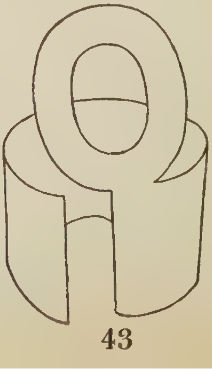
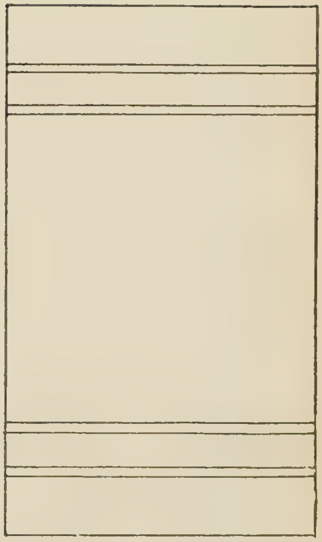

43

from stiff white paper, cut and bent, and pasted together in one or two places with a drop of glue. The washstand bowl can be fastened to the wall with two thumb tacks or bright headed tacks of some other kind, that will remind us of nickel faucets. Two more can be put into the wall just over the end of the bath tub. A piece of silver paper with a white frame around it will make a looking glass to hang over the washstand. Then "the children" can be sure their faces are really clean when they wash them for dinner. (Nos. 37 to 45.)

If you have some modeling clay you will find you can make some very interesting bath room furnishings with that. If you are careful they will last quite a long time without crumbling.

You will surely want some rugs in your house. There should be one in the living room in front of the fireplace, at least one in the bed room so that "the children" will not have to step on the cold, cold floor when they jump out of bed in the morning, and one in the bath room in front of the tub. You can make these out of paper and color them with crayons. Or perhaps you would like to weave some rugs for your house. If so, turn to Source Picture Number 20 and look at the little looms in the panel at the right hand side. You could make a rug on one of those and it would be just about the right size. Chapter XX will tell you how to do that kind of weaving. (Nos. 46, 47, 48.)

Did you ever see electric light fixtures like those in the pictures? They are made from the little brass curtain hooks that are kept in every hardware store. You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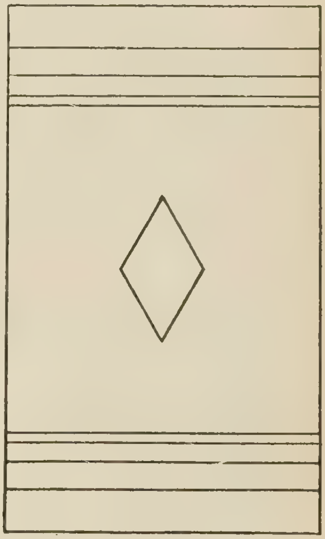
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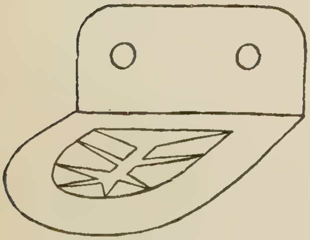
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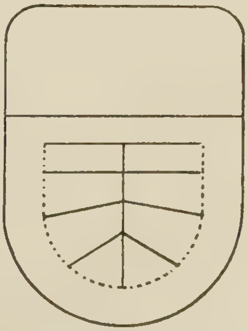
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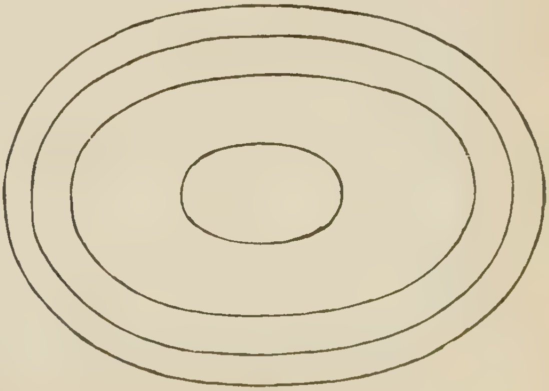
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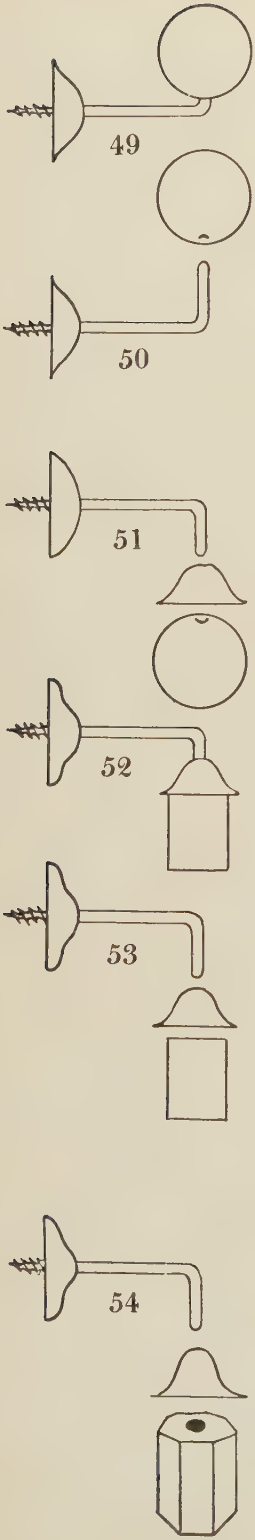
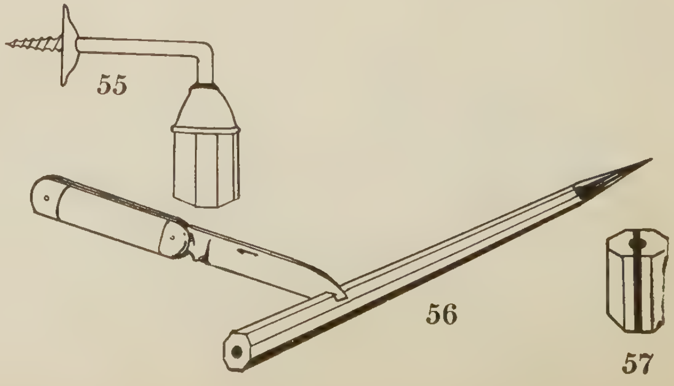


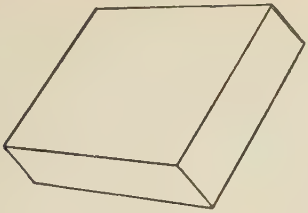
will need just twice as many hooks as you have lights in your house. Take off the little "collar" from half of them and use one just above each "globe" as the picture shows you. Then your fixture will look very real. The globes are made from big wooden beads such as children use in the kindergarten for stringing. A tiny bit of clay or flour-and-water dough, perhaps, can be used to fill up the big hole in the bead, if it is too large for the hook. The pencil end makes a globe of a different shape, and a very pretty one. (Nos. 49 to 57.)

And now what about the boys and girls who for one reason or another cannot get special blocks or cubes for making their furniture? On page 15 and page 16 are some pictures that will suggest other ways of furnishing your house. The first pictures show some furniture made of building blocks, the "bricks" and "half bricks" that are found in every set. In the pictures pieces of thin wood have been used instead of cardboard. If you make furniture in that way you will have to use a coping saw like the one you can see in Source Picture Number 19. The boy in that picture is using such a saw and it is a very useful tool. But if you have no saw you can always use cardboard. Building blocks are generally made from hard wood, and you may find you cannot drive your nails into them. In that case you can hold the furniture together with glue.

Of course there are some children who have no building blocks, and some who do not wish to use their blocks in this way. Indeed, unless you have a great many it is hard to spare them, even for so good a purpose. But there is another kind of furniture that can

Lighting fixtures and spool furniture designs used by permission of A. Neely Hall. From "Home Made Toys for Girls and Boys". Lothrop, Lee and Shepard, Publishers.

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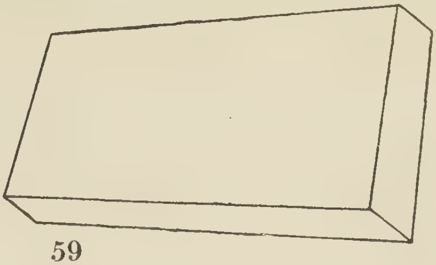
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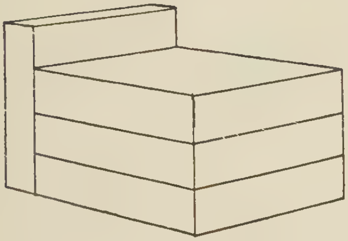
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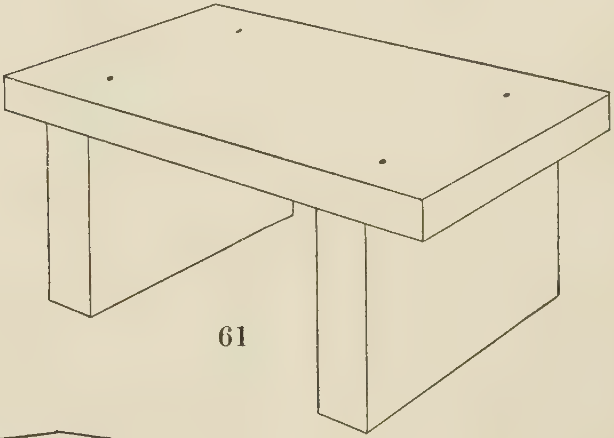
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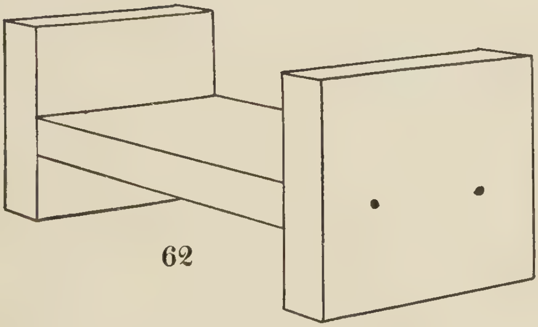
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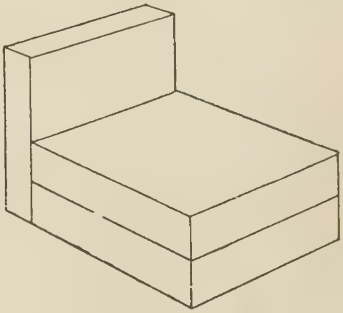
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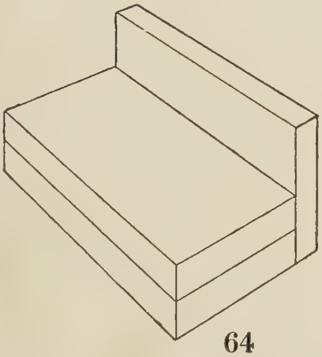
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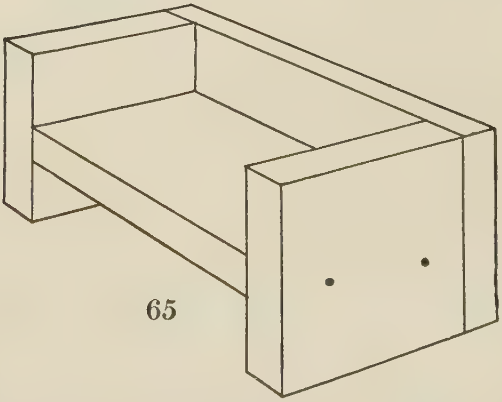
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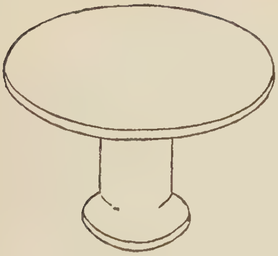

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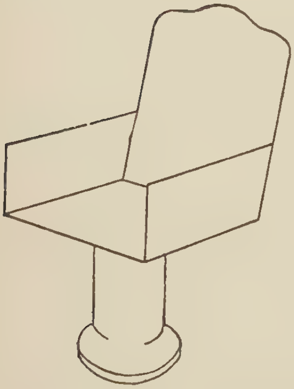
be made for your house, and very good furniture it is. It is sometimes called "spool and cardboard" furniture. You will see some of it on this page. A cigar box has been used to make the bed. And by the way, you will surely want to make a mattress and pillow for your bed. In Chapter XXI you will find a place that tells you how to make them and all the different bedclothes that you will need as well.



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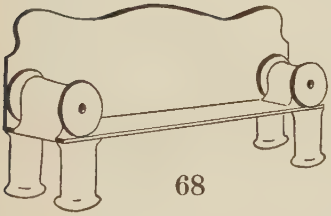
By this time I feel sure you realize that there are many different ways in which you can make good furnishings for your house. You will be able to think of new ways and of new things to make as well. It is a splendid thing to have a drawer or a box where you can keep materials of the kind you are likely to need, paper, pieces of wood, scraps of cloth, nails, thumb tacks, empty spools and all sorts of things useful for your inventions. Things of this kind are so easily lost or thrown away if there is not a special place in which to keep them.



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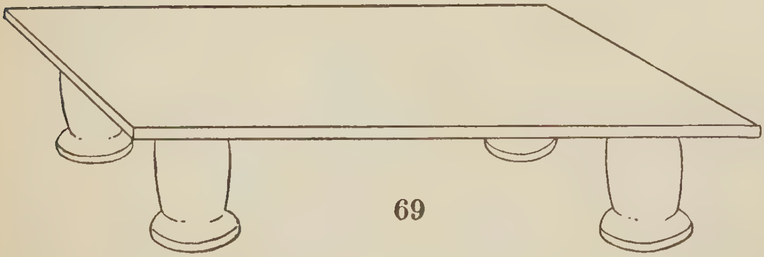
A boy or girl who has really made a house like this one, a house "Where the children live," has accomplished a big piece of work, and has a right to feel very happy over it. Of course some children will be helped by older people when they are making their houses, and sometimes it may be necessary to ask for help about the hard parts. But the more you do yourself, the more interesting you will find the work, and the happier you can feel about it in the end. The more you do yourself the more truly it will be *your* house and the more truly it can be called "the children's house."



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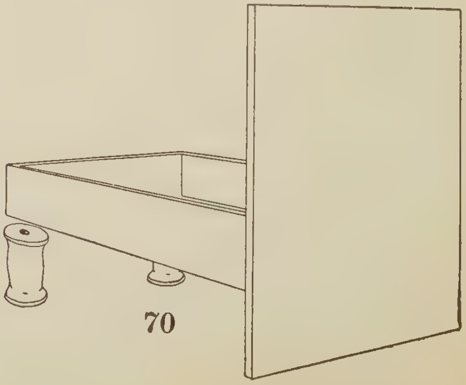

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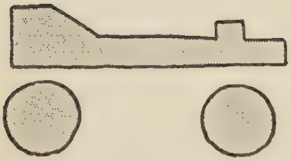
CHAPTER II

Things the Children Use

Do you know how to draw pictures with your scissors? Such pictures are often called "cut-outs," and some children make a great many of them. The "Things the children use" on Source Picture Number 2 of your scroll are all cut-outs as you will see. Nearly all of them are cut with straight lines and so can be called "straight line cut-outs."

When you first begin drawing with the scissors it is a good plan to make cut-outs of this straight line kind. This is true whether you make the cut-out all in one piece, or in two or three pieces like those in the Source Picture. I believe you will find it easier too, if, at the beginning, instead of trying to copy one, you think of something all yourself and then invent your own way of cutting it out. Let me tell you a story that will show you what I mean.

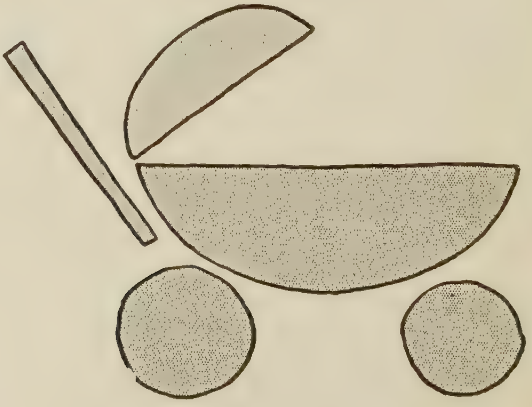
Once a very little girl went to a party. It was one of those parties where you do all sorts of interesting things, and get prizes for doing them. And one of the things they asked you to do, was to make cut-outs. You were given a pair of scissors and a piece of paper, and you made anything you liked. When your cut-out was finished you pasted it on another piece of paper, and gave it to a big boy who was the judge. If he could



guess what it was the minute he looked at it, you won a prize.

So all the children worked hard to make the most interesting cut-outs they could think of. One of them made a Teddy bear, and one of them made a pair of skates. A little boy with a red necktie made a sled, and a little girl with a blue hair ribbon made a baby carriage. The big boy was kept very busy guessing the names of all the things they made.

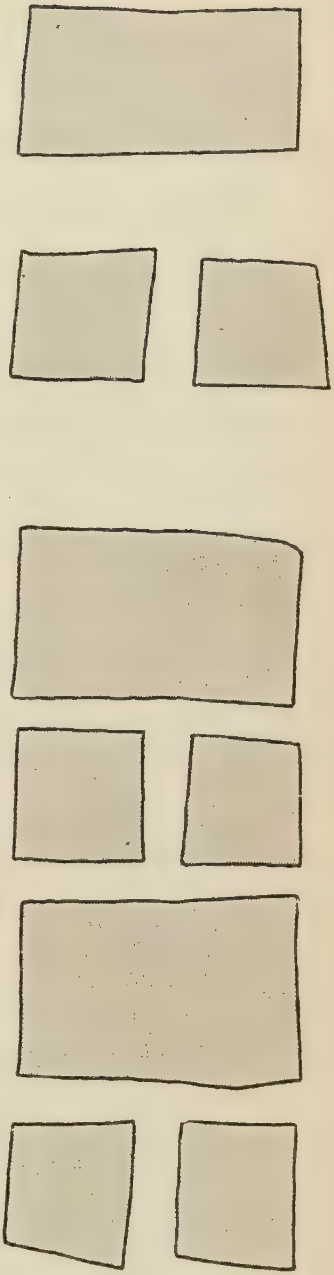
But the little girl I started to tell you about was so very little, she had never drawn a picture with the scissors before. The most she had ever done was to cut up pieces of newspaper just for fun, and make little tiny scraps and queer shapes that did not mean anything. But now she wanted to be like the other children. So she kept thinking "What can I make that the big boy will be sure to guess?" And at last the thought came to her, "I can make a sidewalk." And so she did. First she cut a piece of paper in an oblong shape like the one you see on page 19. Then she cut another like it, and that one she cut in half. Then she cut another piece like the first one, and then another, and that she cut in half. Then she pasted them on her sheet of paper just as you see them there. After that she cut some more pieces, until at last she had quite a long side walk. And the big boy knew what it was the minute

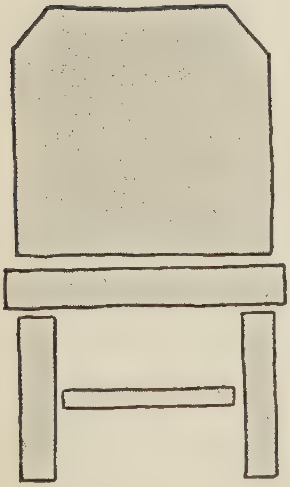


she showed it to him. He said it would make a good sidewalk for a game of hop scotch, and I think he was right. At any rate the very little girl won a prize, just like the other children.

And now I think you can imagine what happened after that. For the very little girl did just what you would have done. After she went home she kept on making cut-outs. Nearly every day she made some. Soon she could make all the things that had seemed so hard that day at the party, when she saw the other children cut them. For that is what is bound to happen when you keep trying to do a thing, and practice it over and over.

But perhaps you think a sidewalk was a funny sort of thing to put in a picture, and that you would never have drawn one if you had been in that little girl's place. Well, we must remember she was a very *little* girl. Yet, little as she was, she could understand that a cut-out with only straight lines was the kind she could make best. That is one thing to remember about her side walk, and another interesting thing about it is that she invented it herself. Remember that if you find it hard at first to copy the cut-outs of the "Things the children use" on your Source Picture. They were not put there to be copied, really, but to give you some ideas about cut-outs and about how they can be made.



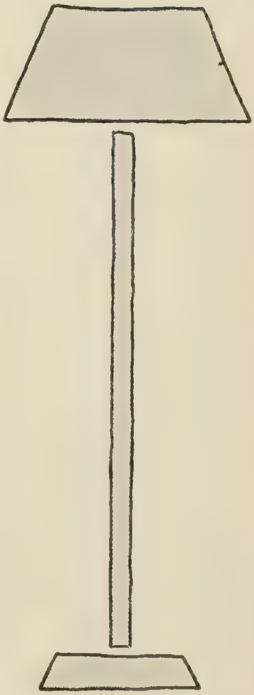


Just as the very little girl learned a great deal about cut-outs by seeing those the other children made at the party, so you can learn by seeing these. Then you will be able to invent your own.

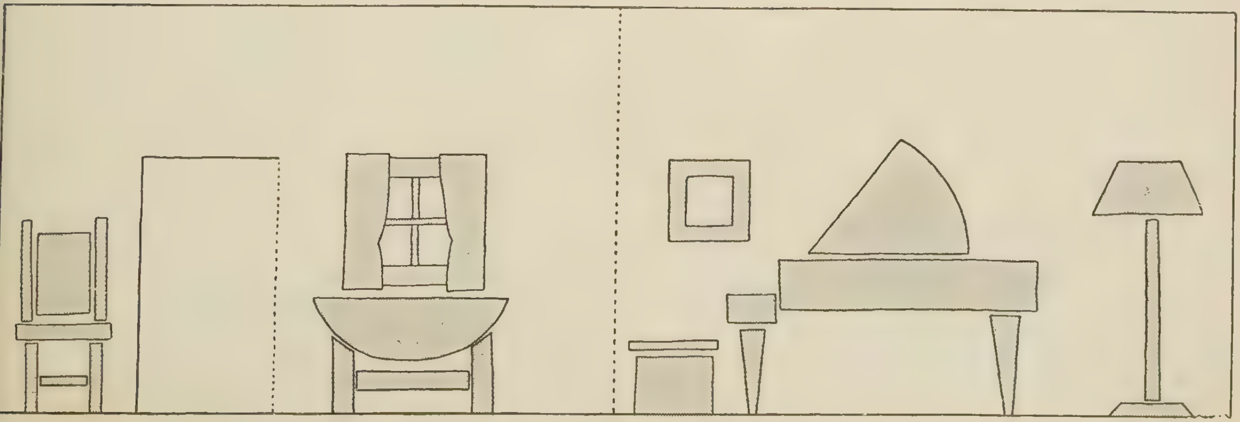
Perhaps you will want to make pictures of all the things you have in your own room, or of the things you make for the house "Where the children live." If you go to school, you can make all the different things that are in the school room. The different things that are in the playground will make good pictures, too.

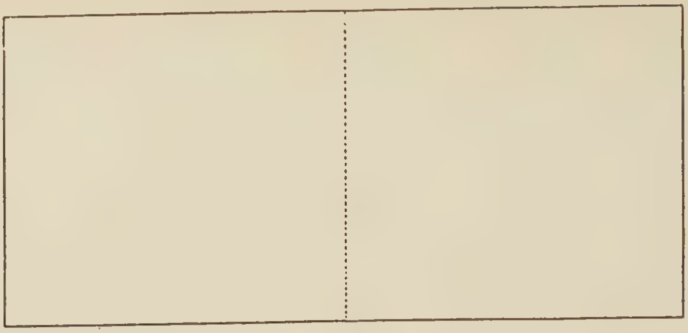
Cut-outs are interesting whether they are made of colored paper, or just of plain white paper. Some of the best I have ever seen were made from wrapping paper that children had saved from packages, just the everyday sort of packages that come into our homes from stores or through the mail. It is possible to make very good cut-outs, too, from newspaper, for you can always color them with your Hy-San colors. Moisten the end of your hard crayon and lay the color on as evenly as you can. With your darker colors you will find you can cover up all the black print marks. And sometimes when they show through the lighter colors, they make quite a pretty looking pattern. Some children color their paper first and then make their cut-outs. Others color the cut-out after it has been pasted down. When you do that it is a good plan to use your paints and brushes. You can also use the soft Hy-San crayons (No. 80).

When it comes to pasting them down, you will find it a good plan not to have too many little pieces in your cut-out. Indeed, the fewer pieces that you have, the more easily you can paste them in place, and make the picture look as you intended it should. No doubt the hardest of all the cut-outs on your Source Picture, when it came to the pasting, were the cut-outs of the blocks down in the lower left hand corner. To be sure they are a good deal like the pieces of the side walk that was made by the very little girl, but the pieces of her side walk were very much bigger, and so were much easier to paste in place.



You will surely wish to make a scrap book for your cut-outs some day. When you succeed in making really good ones, it is just too bad to lose them or throw them away. And even if they are not very good at first, it is interesting to keep them any way and see how you improve as you go on making them. Sometimes it is a good plan to keep a special scrap book for certain kinds of pictures. In some scrap books too, you can have a page for special things. For instance, if you should make a cut-out scrap book and call it "Things the children use," you could have a page for playthings, another for the things you use when you work, another perhaps, for the things you use in the garden, and one for the things you use at the table. Do you know how to "set the table?" Try cutting out all the things you need to set your own place for dinner, and then paste





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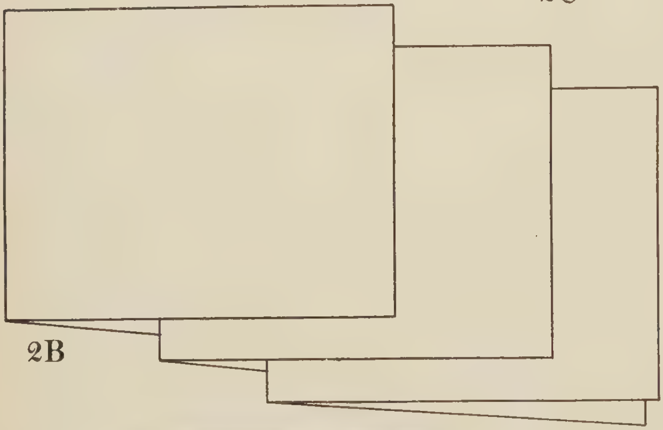

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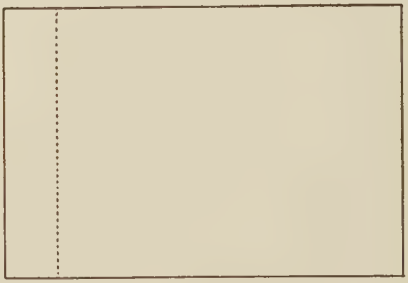

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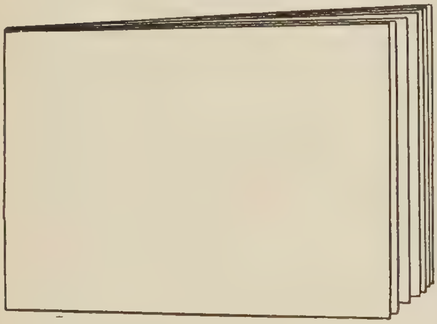

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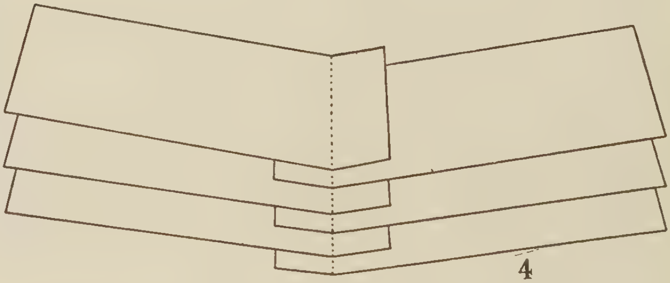

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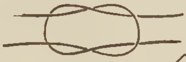

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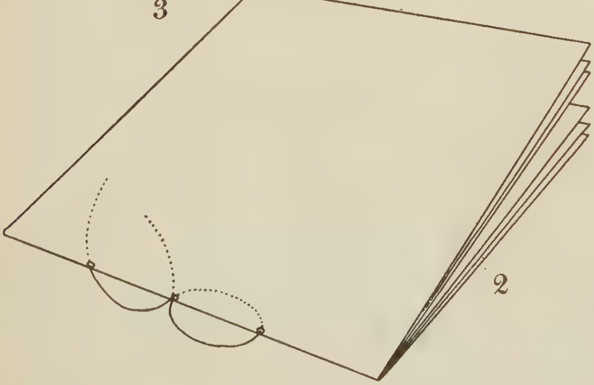

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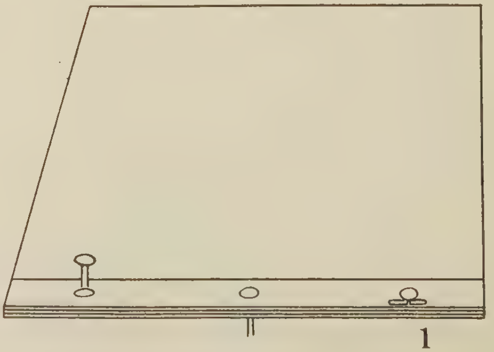
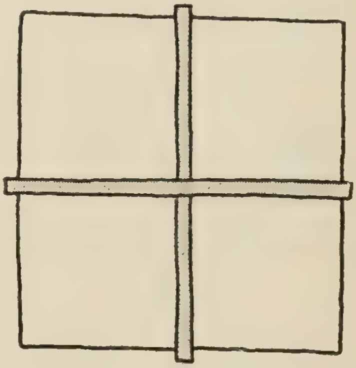


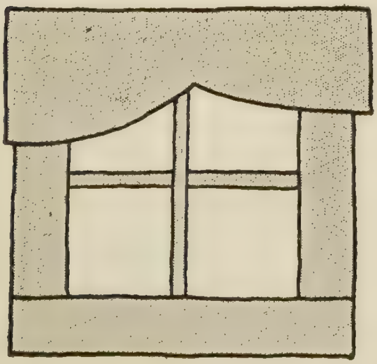
1

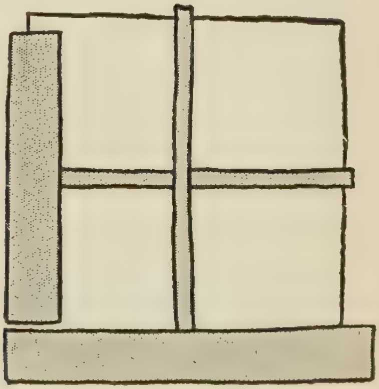
them in the right places on a page of your scrap book.

Another kind of scrap book that many children love to make, can be used as a paper doll's house, and might very well be called "Where the children live." You have probably seen that kind. The two pages that face each other make a room, and if you like, you can cut doors between so the paper dolls can go from one room to another. You can put in windows, too, with window panes of blue or gray tissue paper to look like glass, and strips of paper for the window frames. Then you can put paper curtains at each side or a ruffle, perhaps, across the top, just as you see in the different pictures on this page. On the front page of the book you can make the front door of the house, and perhaps you can put a window on each side, and have flowers growing on either side of the door step. It would be nice to make the two pages next the last into a garden, and if you did that, you could cut out your window in the last room of the house and so look right out into the garden through it.

Scrap books can be made out of leaves of heavy wrapping paper cut in the size and shape you need them. They can be made out of manila paper, too, of the kind that comes in packages for children to use. This is sold in stores where they keep school and kindergarten supplies. The pictures on page 22 show some different ways of putting the leaves together, and put-

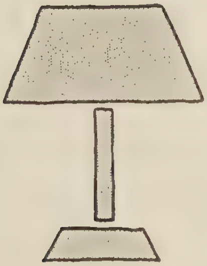




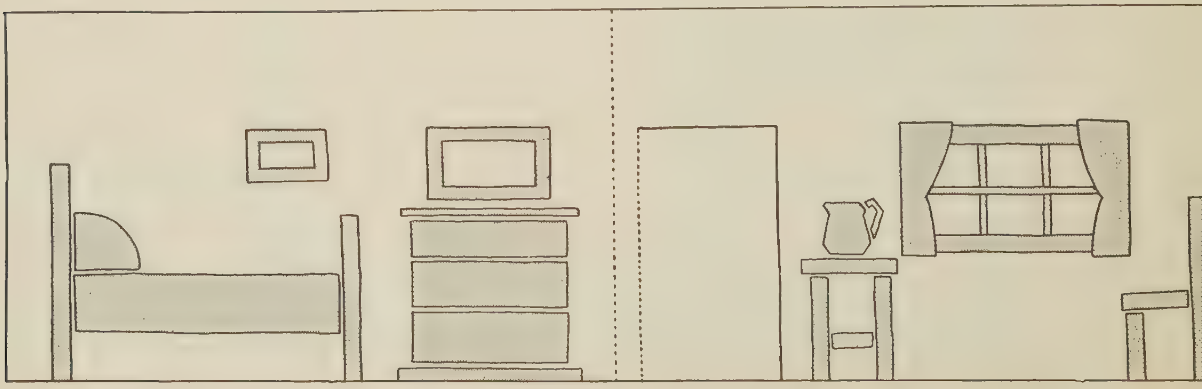


ting on the cover, "binding" the book as we say.

A loose leaf book makes a good scrap book. It is always possible to add more pages to it, or to take out a page that has been spoiled or torn, and put in a new one. The pages of the loose leaf book (No. 1) are held together with paper clips. Three clips are run through holes in the stiff cover boards, and these match holes cut in the pages. A book like this can be made in any size or shape according to the size and shape of your paper. Each sheet of paper makes a separate page. Instead of paper clips a piece of string or heavy silk thread can be laced through the holes at the back to hold the book together. The holes should be an equal distance apart. Measure the places for them carefully. Put those at the top and bottom about an inch from the edge of the cover. The third hole should be just half way between them. Mark the places with a pencil first, and then punch the holes with the points of your scissors, or with a card punch, if you happen to have one.

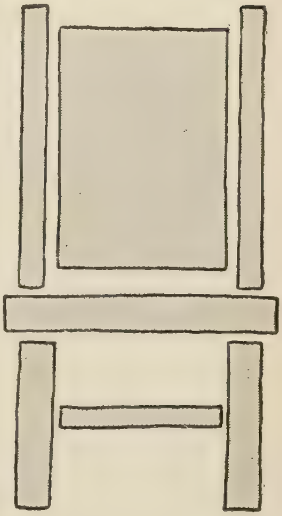


The other books on page 22 have their leaves sewed together. One of them (No. 2) is made by folding the sheets of paper and sewing them to the folded cover as the pictures show. The sewing is done with heavy silk and a big needle. Notice just how the needle is put through from the inside to the outside of the book and then brought back to the inside again in such a way that the pages are held firmly. The ends of the silk

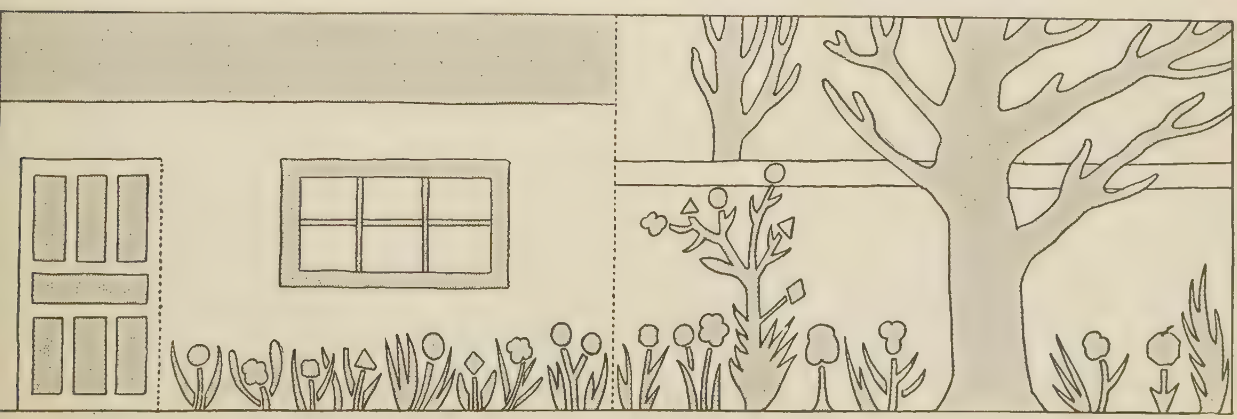


are tied together inside the book in a square knot, one that will not slip. The picture (No. 3) shows how to tie it.

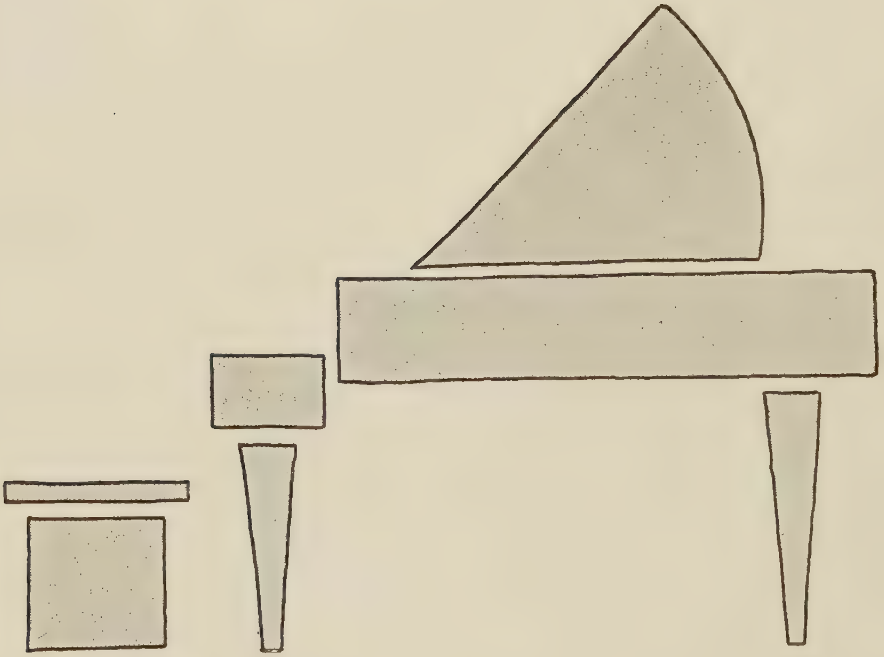
The last book (No. 4) has been planned so that its pages shall be as large as possible, and yet be sewed instead of being laced or clipped together. Nearly the whole of a sheet of paper is used for each page. Only a little piece of each one has been folded over to make a "stub". The picture shows how the leaves are fitted together. The stubs are laid first on one side, then on the other. The sewing is done with a needle and silk, and the ends are tied in a square knot.



Of course you will often make cut-outs of flowers and animals, and of people and trees, and of many other things, as well as of the "Things the children use". As you look through the pages of this book you will find a great many pictures in it that have been cut from paper. People always find that paper cutting helps them to do other kinds of drawing, and some artists think cut-outs make the very best posters and pictures for advertising. The posters on Source Picture Number 12 were all made of cut paper, and if you will look at the beautiful drawings made by Joe Jones on Source Picture Number 25 you will be able to understand more clearly perhaps, how paper cutting helps people to do drawing of a different kind. Joe began making cut-outs when he was a very little boy. Indeed he was a great big boy before he even knew that he could make



pictures in any other way. But later he drew with crayons, and with pencils, and with brushes, and all his drawings show the clear and beautiful lines that he learned to make when working on his cut-outs. He never suspected it, but he was really drawing then—drawing with his scissors, all the time!

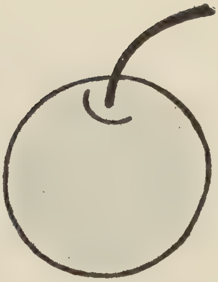


CHAPTER III

What the Children Eat

CAROL and Betty and Bob were working with their new Chautauqua Desk. They were making pictures of "What the Children Eat" and they each made a different kind of picture of the things that interested them. Bob drew his on the green drawing board. He made a birthday cake—a great big one. It was not just like the one on the Source Picture. He thought he could improve on that one. He put more candles on his, for he was seven years old, and he made them of different colors. In the middle he put a tall "life candle." He made that white. He made the frosting of his cake white too, but he put some little brown streaks in the sides to show it was a chocolate cake underneath. Carol's pictures were paper cut-outs. She made one for each of the vegetables on the Source Picture, for she was learning to like vegetables and finding out interesting things about them every day. Betty got her modeling board, took some clay out of the big jar where it was kept, and made her pictures in clay. First she made a banana and then she made an apple. Then she made a pear and an orange.

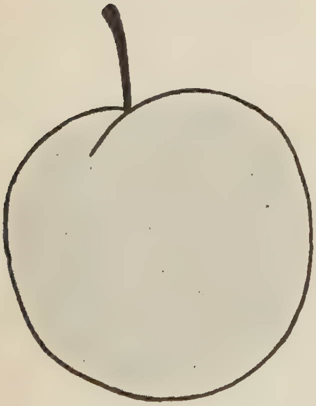
When they had done all these things, the children began to wonder what to do next. For you see their desk and their scroll were new, and they did not understand the Source Picture very well.



Carol thought it very funny that there were no onions or beets or turnips on it. Bob said there ought to be a turkey and cranberry sauce. Betty was sure there should be some grapefruit, and peaches, and cherries, and plums, yes, and watermelons, too. Just then their mother came into the room.

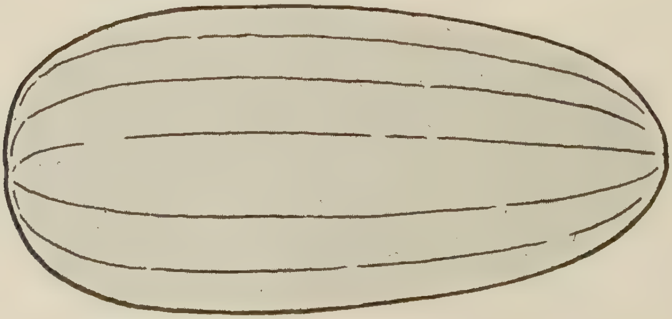
"Mother," said Bob, "lots of things that ought to be on this Source Picture have been left out, and we've already made pictures of most of the things that are there. What else is there we can do?"

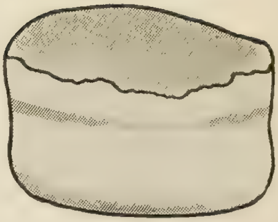
Mother thought a minute. "Of course," she said, "the Source Picture was never intended to show us all the things the children eat. It would take a whole scroll at least to do that, and it is not necessary. You children know what the different foods look like, without having to see pictures of them. All the Source Picture can do is to show you a few that will help you to think of others."



"Does it want us to make pictures of the others out of our heads?" asked Carol.

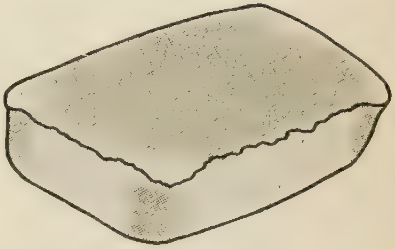
"Yes. You and Betty have already thought of a good many fruits and vegetables. You know very well the shapes and colors that all of them ought to be. Even if you should have trouble remembering, you could easily get some real ones to look at in the kitchen, or the garden, or the grocery store."





"Well, I thought of turkey," said Bob, "and I know I can think of ever so many other kinds of meat."

"What you will notice about the Source Picture is this," said Mother. "It shows you different *kinds* of food. Any special food that you may like to eat or happen to think about, belongs to some one of the kinds that are in the picture. Take bread, for instance. The loaf in the picture is just a plain, white one. But think of all the loaves you have ever seen, and all the different colors, shapes and sizes in which they come. Think, too, of the different rolls and muffins and biscuits, and even the pancakes and waffles that belong to the same family. We might call them the first cousins of that loaf of bread."

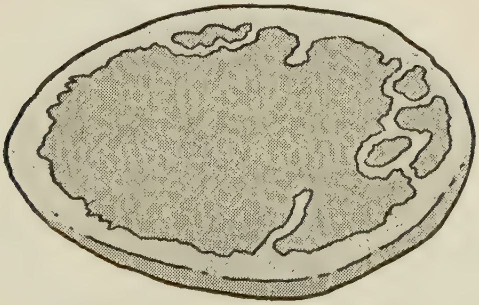


Betty laughed, "It would be fun to make them out of clay," she said. "I'm going to make a soda biscuit this minute." And so she did, and when it was dry she painted it to make it look more real. First she painted it white all over with her Hy-san Colors, and then she put a little light brown on the top.

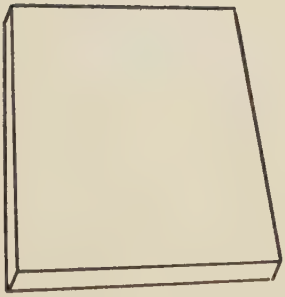
"What a good cook you are!" said Bob. "Can you make a doughnut?"

"Of course!" said Betty, and she made that next.

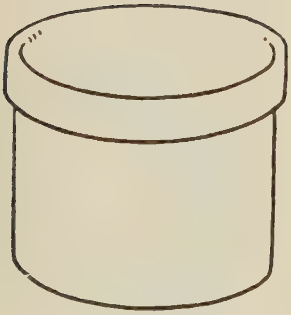
So for a long time they used the Source Picture in this way, drawing and making the things they saw

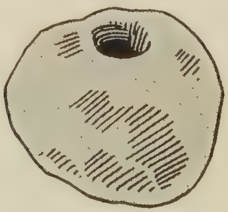


on it, and other things that they thought of when they looked at it. And they found it great fun to make most of them in clay. I am sure you will too, when you try it.



Do you know how to use clay, and how to take care of it? Perhaps there are some clay beds near where you live, or perhaps you know of a store where you can get modeling clay. It is sold by school supply stores and costs very little to buy. But clay is very bad stuff to bring into the house unless you know just what to do with it. This is true whether you dig it or buy it. A stone jar or "crock" with a cover is the best thing to keep it in. You will see one in the Source Picture, and in the picture on this page. A small covered pail or even an old kettle with a good lid would do. Clay needs to be kept moist, and if it is very hard when you first get it, it should have a little water put with it. Then it will soften and you can knead it with your hands. It should be kneaded thoroughly until it feels moist and sticky. Make it just a little thicker than bread dough, so it will hold together in the shape into which you mould it. When you have finished working with it, roll it into balls about the size of an apple before you put it away. In the top of each "apple" make a dent with your thumb. Fill it with water, and put the "apple" away in the crock with the dented side up.

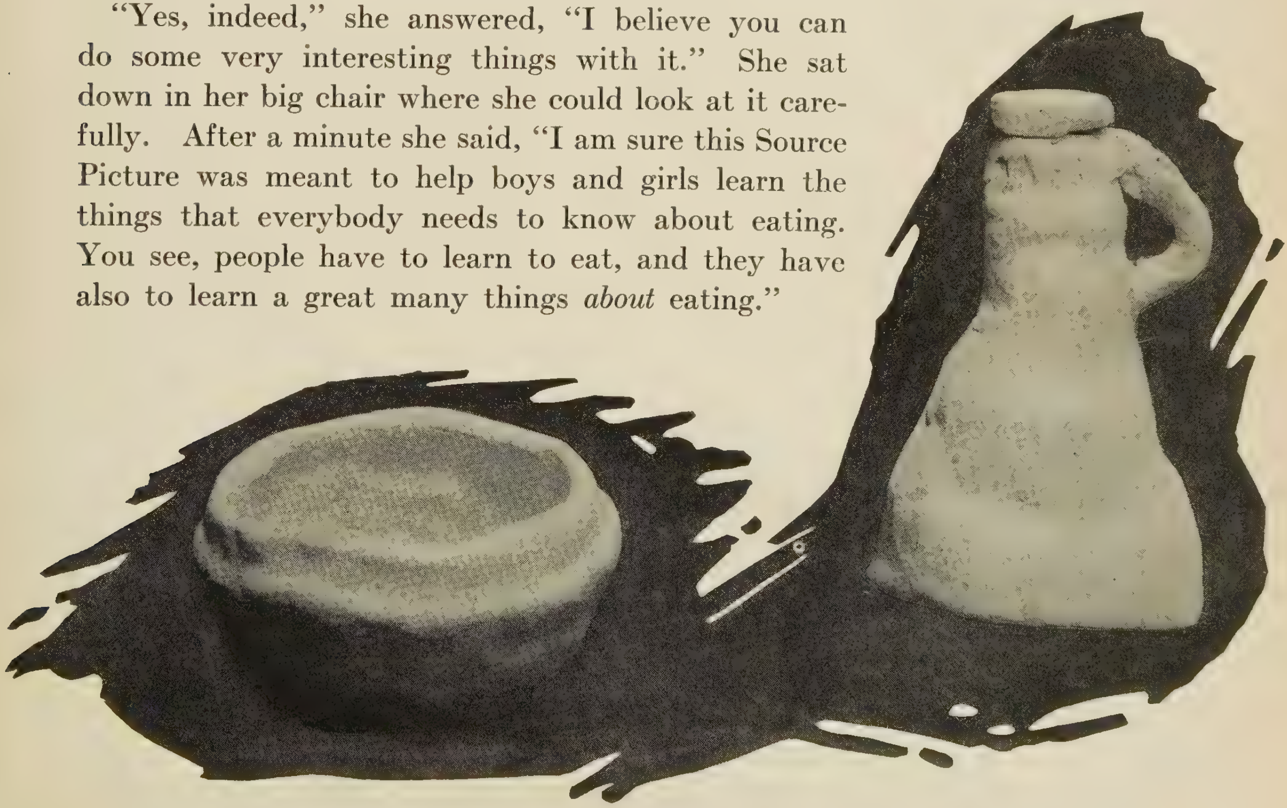




This will keep the clay moist for a day or two, and you will not have to soften it every time you use it. A square of oilcloth spread over the top of the crock before the cover is put on, will help very much to keep it from drying out and getting hard. Before you start modeling, cover your table with a piece of oilcloth, or with two or three thicknesses of newspaper. It is a good plan to have a little modeling board, or even the cover of a cardboard box to work on. Then, when you finish a thing, you can pick it up from the table and carry it away without breaking it, as might happen if you tried to lift it up from the table top. If you shape your clay models of vegetables and fruits carefully, you can make them look very real by painting them.

One day Carol and Betty and Bob wanted to try something new. So they asked Mother, "Isn't there something else we can do with the Source Picture?"

"Yes, indeed," she answered, "I believe you can do some very interesting things with it." She sat down in her big chair where she could look at it carefully. After a minute she said, "I am sure this Source Picture was meant to help boys and girls learn the things that everybody needs to know about eating. You see, people have to learn to eat, and they have also to learn a great many things *about* eating."

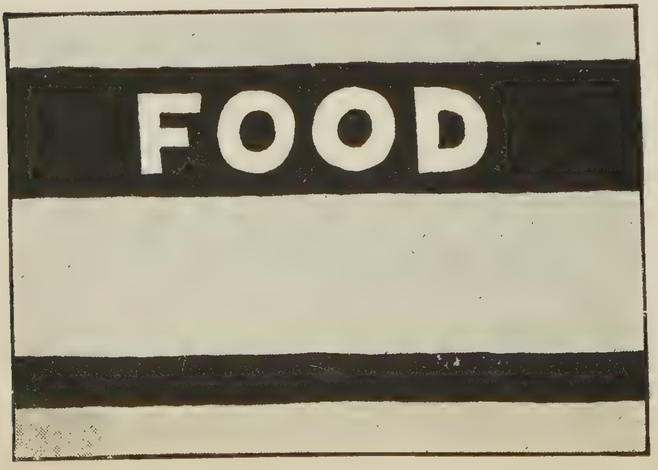


"Learn to eat!" laughed Bob. "What is there to learn? And what could anybody learn *about* eating?"

"They are two different kinds of learning," said Mother, "and of the two, learning to eat comes first and is more important. As you know, very little babies are fed first of all by their mothers. Then as they get bigger we begin to give them something besides their mother's milk—water, and fruit juices, and cow's milk, and cereal, and later vegetables, and soup, and eggs, and then a very little meat. All these things are new to them, and learning to eat them and to like them, is one of the most important of all kinds of learning. Until we can eat and enjoy the foods that we need to make us grow and to keep us well, we have to be treated more or less like very little children, instead of being treated like grown-ups as we would like to be."

"But not all grown-ups eat the things they should," said Betty. "Lots of them never drink milk."

Her mother nodded. "It is true some grown-up people never learn to enjoy all the different foods that we see every day, in the markets and on our dinner tables. They have a much harder time keeping well and getting enough to eat, than they need to have. Perhaps they are not really as grown up as they look, if they have never learned to eat the really important kinds of food. Perhaps, too, they



have never learned very much *about* eating."

"What *are* the most important kinds of food?" asked Bob.

"I know," cried Carol, "vegetables!" Her mother laughed.

"They are important, Carol, but there is another way to think of foods that is more helpful, I believe, than if we think of them just as being vegetables, or fruits, or meats or breads."

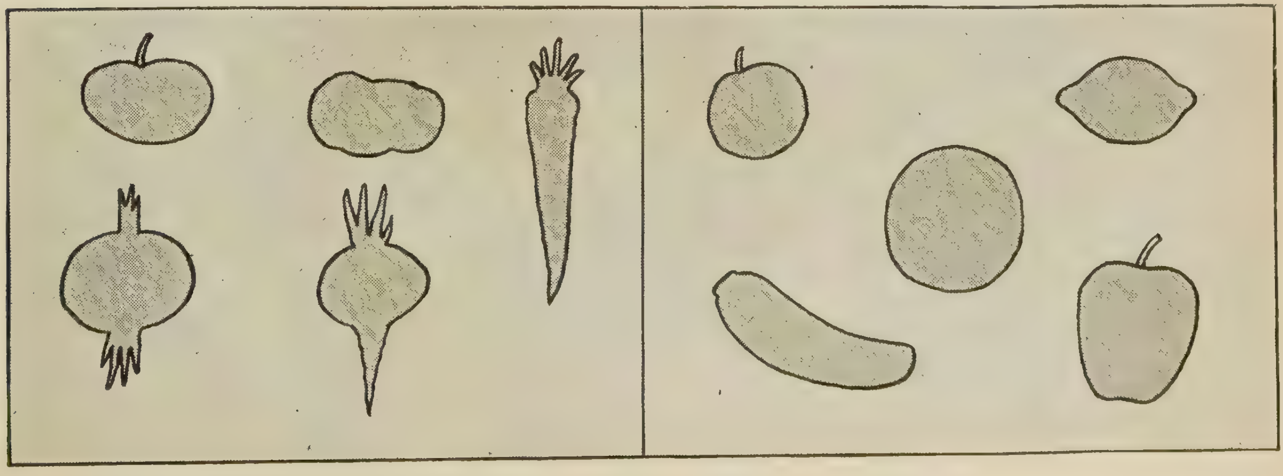
"Oh, yes!" said Betty, "don't you remember the rhyme we made up one day:

'I eat some things to make me grow
And some to make my engine go.'

We never finished it. We couldn't think of a last line."

"That is just what I mean," said Mother. "If you look at the Source Picture, you can pick out the foods that make you grow, and the foods that make your engine go, and some other kinds that are important too. A great many foods are important because they keep people well. We can never be as big or as strong as we might be, unless we eat them. That is true even when we have plenty of growing food, and plenty of engine food. Nearly all fruits and vegetables are foods of this kind."

"But how can we remember which is which?" asked Bob. "Will the Source Picture help us to do that? Perhaps it would if we made a scrap book.



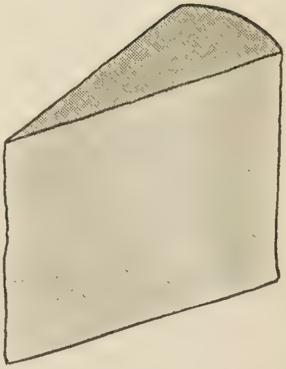
Why don't we? We can put all we know into it, and if we forget anything afterwards, we can look it up again."

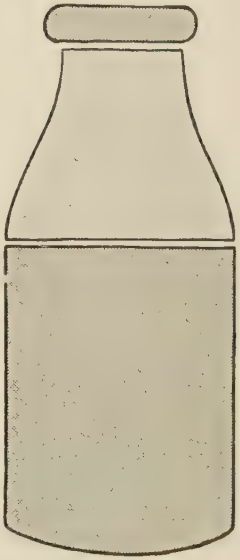
So that is what these children did. They made a great big scrap book with leaves of wrapping paper. It was the loose leaf kind, so they could add as many pages as they liked. And before they were through they had a great many pages, and their book was very interesting.

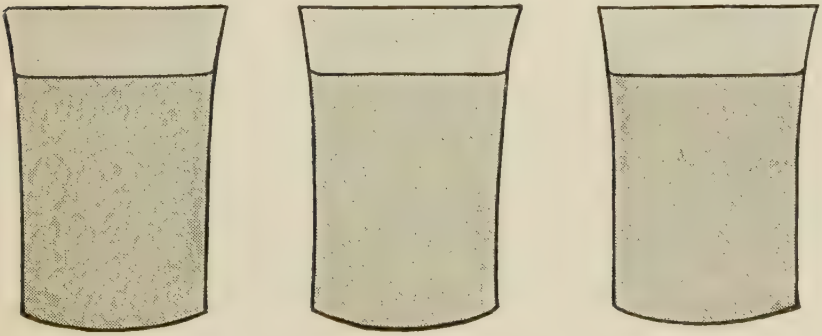
They began with the foods that make children grow because, like all children, they were especially interested in those, and wanted to be as tall and grown up as possible. And as milk is the most important food of this kind, and the very first food on the Source Picture, each one made a milk page for his book. Carol's page had a big milk bottle in the middle of it. She made it out of paper because Carol loved to make cut-outs. The top of the bottle was a little yellower and showed where the creamy part of the milk had separated from the rest. At one side of her bottle there was a dish with butter on it, and on the other side there was a dish with cheese on it. An arrow pointed from the butter to the cream in the top of the bottle, and another pointed from the cheese to the milk in the lower part. Then there were three glasses of milk on the page—one at the top, and over that was written the word

"Breakfast," one at the right side with "Dinner" written over it, and one at the left side with "Supper" written over it. At the bottom, underneath the milk bottle, there was a dish of soup like the one in the Source Picture because, as Carol said, "Food that is cooked with milk is 'growing food' too."

And Betty had thought of that. Her page had pictures of all sorts of good things that are made from milk. For Betty was a little girl who found it hard to like milk. So she tried to think of different ways you could take it, without having to drink it all by itself. Of course the first thing she thought of was cocoa, and she put a box with "Cocoa" printed on it in the middle of her page. She put a cup and saucer next to it. Then she remembered that malted milk was good too. So she put a malted milk bottle on the other side of the cup. You had to guess, she said, whether it had cocoa or malted milk in it. Whichever it was, you knew it must be nice and hot by the way the steam came up from the cup. In each corner of the page there was an ice cream cone. One had white ice cream in it, and one had pink. Then there was one with brown for chocolate, and one with the light green color that you see in some ice cream. At the bottom of the page was a big dish of rice pudding, and all around the sides were dishes of junket, and pot-cheese, and chocolate





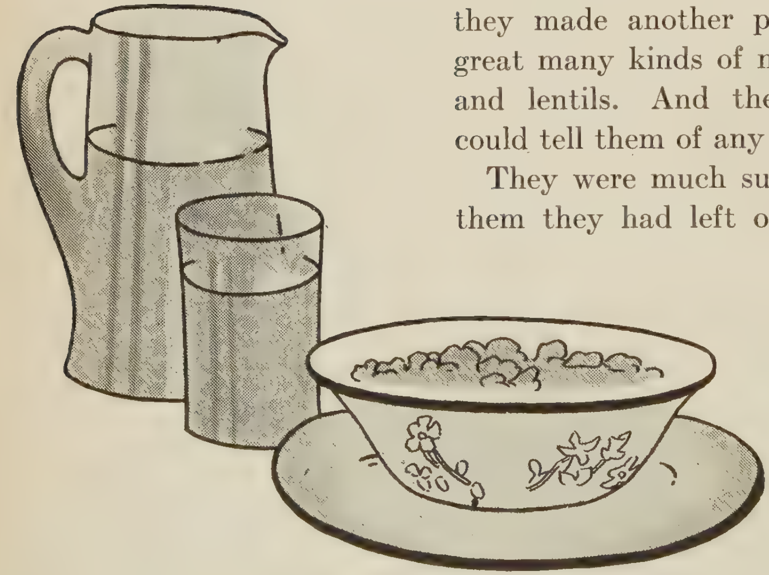


pudding, and things of that kind. When the page was done it made you feel quite hungry to look at it.

But Bob's page was entirely different. He told the story of milk. First you saw the cows eating grass and clover in the pasture. Then you saw them in the barn being milked. Then you saw the farmer taking his big milk cans to the train very early in the morning. The sun was just coming up over the hill. Then you saw the milk train going to the city. The engine was puffing smoke, and the door of one of the cars was open so you could see the milk cans inside. The last picture showed the milkman's cart stopping in front of a house, and the milkman was carrying two bottles of milk to the kitchen door. These were the first three pages in the children's book.

After they had finished their pages about milk, they made pages about other growing foods. Bob made a meat page. Betty made a poultry and egg page. Carol made a fish page. She put in pictures of people fishing as well as pictures of the fish. Then they made another page, and on that they put a great many kinds of nuts, and dried beans, and peas and lentils. And then they asked Mother if she could tell them of any more growing foods.

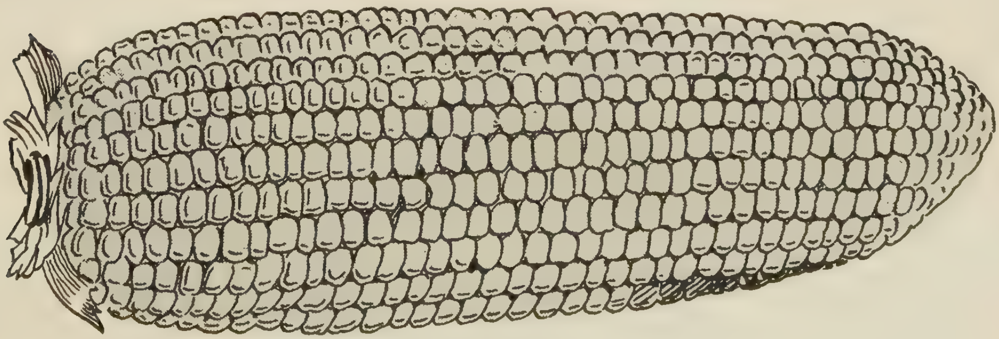
They were much surprised when their mother told them they had left out a very important kind, the



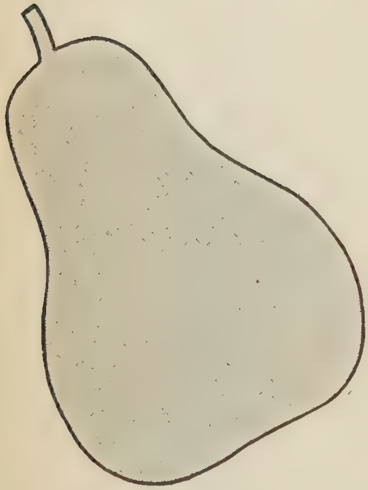
cereals. "But I thought they were engine foods," said Carol.

"So they are," said Mother, "and they are growing foods as well. The dark parts of the cereals are growing foods, and the light parts are engine foods. Why not give the cereals a special page as you did milk?" That seemed a good plan, for the more they thought about cereals the more important they found them to be. So at last they took several pages for them, and for the things to eat that are made from them. They had pictures of cereals growing in the fields, and pictures of the mills where they are made into flour. They had pictures of the factories where the grain is made into breakfast cereals, and biscuits and bread. Then they made pictures to show the ears of wheat, and the ears of corn. And they made pictures of rice and oats and barley and rye as well. And they had pictures of all sorts of breads and macaroni. And they wrote down that cereals were mostly engine foods and partly growing foods.

Now I wonder if you know what they meant by engine foods? Did it ever seem to you as if boys and girls must have engines inside of them? They certainly have something that keeps them warm and keeps them "going" from morning until night. In a steam engine we put in coal and we put in water.



The coal makes heat and the water makes steam, and the steam makes the engine go. In an auto we put in gasoline, and burn it with an electric spark to make the engine go. Burning the coal and the gasoline makes what we call "energy." With boys and girls almost the same thing is true. A great deal of the food they eat makes a kind of steam or energy, that keeps them going when they work and play. Just as the coal and the gasoline are burned, so this kind of food is burned in our bodies. It keeps us warm, too, at the same time that it keeps us "going." The harder our engine goes, the more of such food we need to eat. In winter weather and in cold countries, people need much more engine food than they do in summer, and in hot countries.



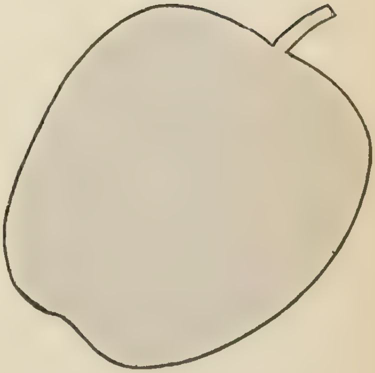
When the children came to make pages for the engine food, they picked out the box of cereal on their Source Picture, and the loaf of white bread, and the potato. Their mother told them they might add the banana, because that was nearly all made of starch, like the potato and the white bread, and had a great deal of sugar in it, too. Sugar she said was an engine food.

"Then why not add the birthday cake and the cookies?" asked Carol.

"Yes, indeed," said Mother. "This is the place for them, and for all the sweet things you can think of. Put in the butter, too, and the fat part of the

meat, for they are engine foods, as well as growing foods. And put in the yolk of the egg, for that is one-third fat. Starches, fats and sugars are all engine foods."

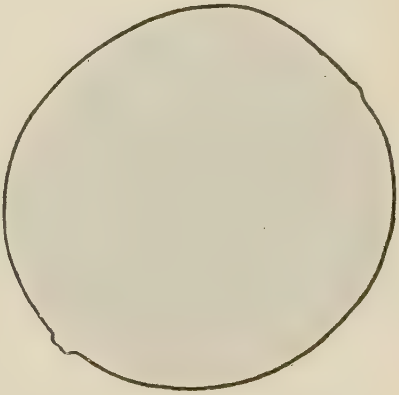
"Hurrah!" said Bob, "I'm going to make a page on the story of sugar. We learned about it in school, and I know just how the sugar cane grows down in the South, and how they make it into molasses first, and all about it."



"Isn't sugar sometimes made from beets?" asked Betty.

"Yes, very good sugar is made from beets. Nearly all vegetables have some sugar in them, and the sugar beet has a great deal. Can you think of any other kind of sugar?" asked Mother. Carol thought of maple sugar, and Betty thought of honey. Mother said that honey was once the only kind of sweetening people had for their food, and that they got along very well too, in those old days—better perhaps than we do today, when we have so many sweet things to tempt us. "Sugar is good engine food but very hard to digest," she said, "and people like it so much, that they eat a great deal more than they need. It is very foolish to eat more than we need of any food. To do so is always bad for us in the end."

"But isn't sugar worse than other things?" asked Bob. "People talk as if it were."



"And they are right," said Mother. "Sugar takes away our appetite for other foods. It gives us only engine food and not enough of that. No one could possibly eat enough sugar to keep his engine going on that alone. He would be very ill long before he got enough. But anyone can easily eat enough sugar to spoil his appetite. Then he will find he cannot eat as much food of other kinds as he needs. The sugar may make him fat. Sometimes it does. But it cannot possibly make him tall or strong. So, if he eats a great deal of it, what do you think happens?"

"He doesn't grow," said Carol.

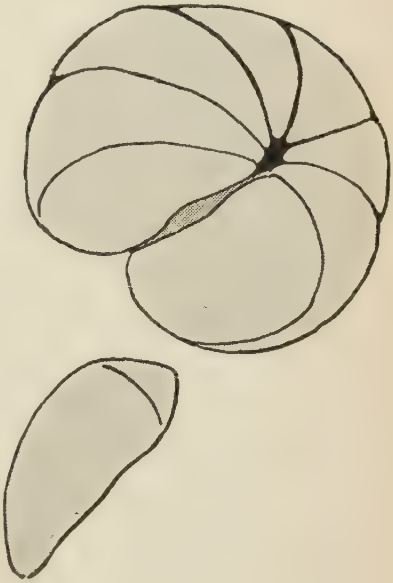
"He hasn't any pep," said Bob.

"He gets ill," said Betty.

"Yes," said Mother, "any one of those things, or all of them may happen. And something else is very likely to happen. For sugar is very bad for our teeth. People who eat too much of it, especially people who are always eating candy, spoil their teeth and have lots of trouble with them. Then, instead of being hard and white, and seeming clean and nice to other people when they laugh and talk, their teeth grow soft and dark colored. Decayed places come in them, and they have toothaches and even worse troubles. Their teeth find it harder and harder, too, to do their work well, and to grind up the dif-

ferent kinds of food, and make them ready so their bodies can really use them. Some children have poor teeth, even when they brush them as they should after each meal. Very often, if they only knew it, the trouble lies with the candy and sweet things that they eat every day. Too much sugar will spoil our teeth in spite of anything a tooth brush can do to save them."

The third kind of foods the children learned about, were the foods that keep us well. And by this time they understood that nearly all the foods on the Source Picture belonged to more than one kind. The vegetables and fruits that take up so much space on it, and are so much more interesting to draw and paint than some of the others, were put there really because they keep us well. But all of them have some sugar or starch in them, and so help our engines when we eat them, and many of them are growing foods too. The juice of the orange, for instance, is a fine growing food. So sometimes they would put a picture of the same food on two pages, when it seemed to be really important in both places. Milk seemed to belong everywhere. For it is first of all a growing food. The butter and cream that come from it are engine foods, and it is also one of the most important of the foods that keep you well.

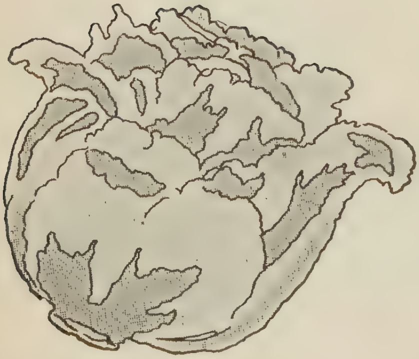


They found that some of the foods that keep us well have special minerals in them—lime that we need for our bones and teeth, and iron. Bob could hardly believe it, when he heard that people needed to eat a very little iron from time to time, if they were to keep quite well. More wonderful still—if anything could be more wonderful—was the fact that the very best iron for eating comes in spinach. Most wonderful of all, so the children thought, were the "vitamins," those mysterious things in milk and vegetables and fruits, that keep us well without our knowing exactly what they are, or how they do it. The most important of all seemed to be the vitamins in milk and in the juice of oranges and tomatoes, and the raw green leaves of lettuce and cabbage.

One day Betty asked why grown up people eat growing foods, as well as children. "They eat more meat than children do, and eggs and every other kind," she said.

"I've been thinking about that too," said Bob. "I should think they would keep right on growing, and some of them would get to be regular giants."

Mother explained that the same foods that boys and girls use for growing foods, are also "repair" foods. "You know how an engine and an auto have to have repairs every now and then," she said.



"It is the same way with our bodies. They, too, wear out and need new parts, but when we are well and strong, the wearing out and the repairing are going on all the time. If we eat the right foods, and exercise in the open air, and sleep long hours at night, the repair work is done in just the same way that the growing work is done. The same kind of food is needed for both. After people are grown up the repair work goes on, and that is why grown-ups need to eat food of this kind. They do not need it any longer for growing, but to take the place of the worn out bone and muscle from day to day."

One day Carol thought of the glass of water on the Source Picture and made a water page. In one corner she put a big pitcher. Opposite, at the side of the page she drew a "water tower." It was made of five glasses, one on top of the other. The top glass said on it "When I get up in the morning." The next one said "Between breakfast and dinner." The next one, "At dinner time." Then came one that said "Right after school." And the last one said on it "At supper time." In the middle of the page there were three rules:

1. Drink at least five glasses of water a day, and more if you want it.
2. Do your water drinking after meals and between meals.
3. Never drink when you have food in your mouth.

Then Bob made a tea and coffee page. He thought they must be engine foods and asked mother about it. But she told him they were not really foods at all.

"Tea and coffee only speed up our engines without giving them any 'gas' to go on," she said.

"How can they? What happens?" asked the children.

"The thing that happens is this," said Mother, "Our engines work on some other food that we have eaten, and use that up faster than they should. At the same time tea and coffee take away appetite, very much as sugar does. So while they speed up our engines, and keep them calling for more and more food to make them go, they keep us from eating as much as we ought to eat. That is the danger when children drink tea and coffee. Often boys and girls who drink coffee for breakfast feel as if they had eaten a whole meal, when they have really had only a muffin, or a pancake, or something like that with it. If they had had an orange for breakfast, a glass of milk, and a big dish of oatmeal with some bread and butter, or toast, their engines would have had some *real* food to go on. But a cup of coffee and a pancake make a very poor kind of 'coaling up' for anybody's engine."

"Suppose they use up all their engine food," said Carol. "Do their engines stop?"

"No," said Mother, "our engines cannot stop. Night and day as long as we live our engines must keep going. So, if we have not eaten enough engine food, we have to burn other food in place of it—growing food, for instance, and repair food, and whatever fat we may have in our bodies to make us plump and help to keep us warm. That is why tea and coffee sometimes make children thin, and sometimes make them weak and small. You can see how it is. Even when a child seems perfectly well, you know he cannot possibly grow as big or be as strong as he might be, if he is using up food he needs for growing and repair work to feed his engine. If all children understood that, I am sure not one of them would drink tea and coffee."

"But what about grown people?" asked Carol.

"It is the same with grown people," said her mother, "only they have already done their growing. Most of them have learned too, just about how much engine food they need to eat every day, and do not depend entirely on appetite to tell them. So tea and coffee are not so bad for grown-ups. Still, even grown-ups are better off without them."

"Well, I can make a great tea and coffee page!" said Bob, and he did. There were two big autos

on it. The driver of one was a tea-pot, and the driver of the other was a coffee-pot. The drivers were saying, "We don't need gas!" and the poor autos were racing along, and looking so worn out you knew they were almost ready to break down.

And now at last the children's book was finished, and they finished up their rhyme, too, and wrote it on the inside of the cover—

"I eat some food to make me grow,
And some to make my engine go,
And some to keep me well and fit,
And some to mend me up a bit."

CHAPTER IV

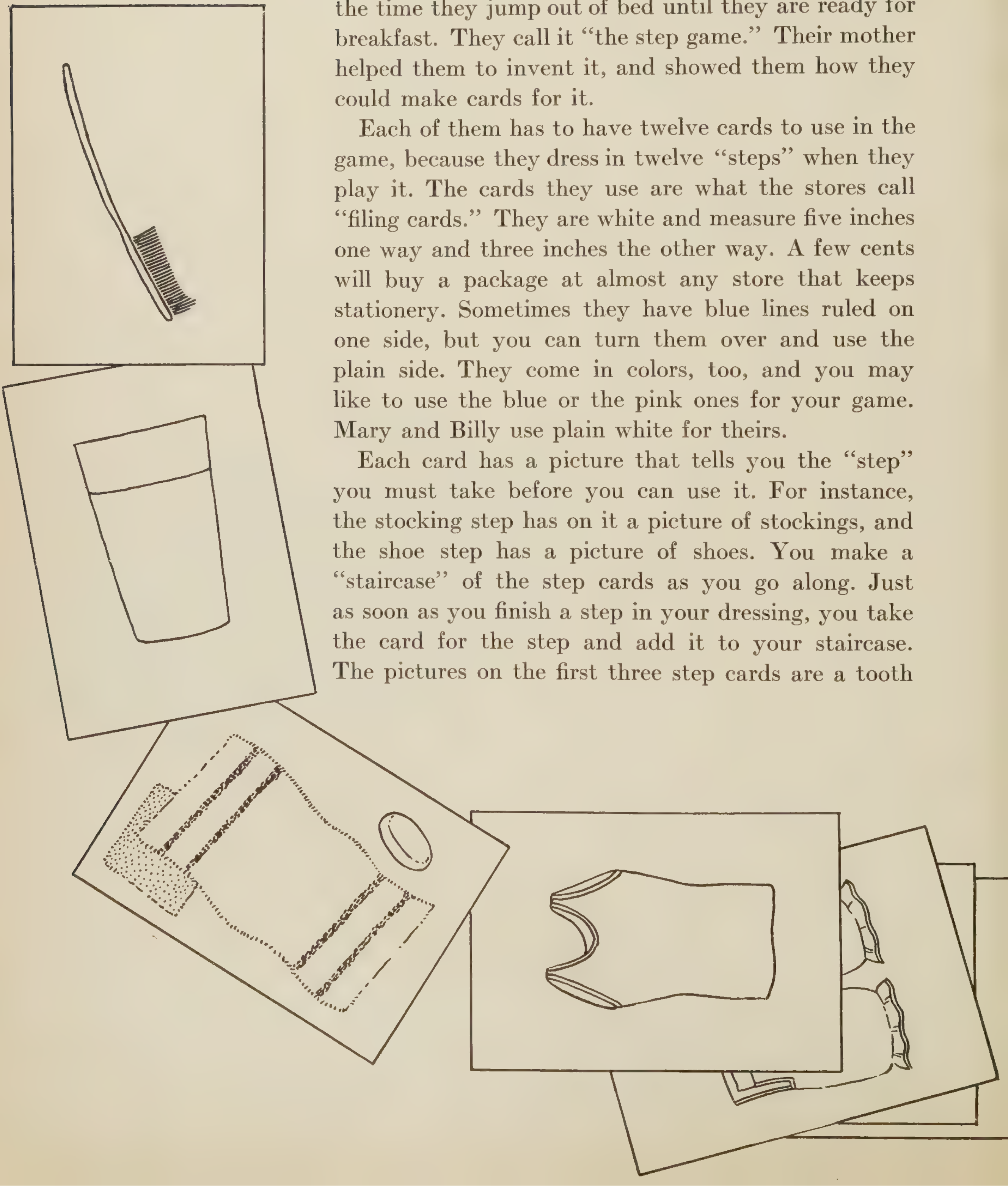
Things the Children Wear

JUST see how wide awake Mary and Billy are when they jump out of bed in the morning! Anyone who looks at them can tell that they went to sleep early last night, and slept like tops all night long. They must have had their windows wide open too, and breathed in the cool air from out of doors all the time they were sleeping. For we never rest so well as when we are breathing in cool fresh air at the same time that we are snugly tucked up under warm bed covers. Now as you can see, these two children are ready to do all sorts of things without wasting a minute, but of course, before they can do much of anything else, they have to get dressed. Getting dressed seems a great waste of time to ever so many boys and girls who get out of bed thinking of things they want to do right away. So, as you know, a great many of them keep stopping to do something else all the time when they should be bathing and getting into their clothes. That makes the dressing take a long, long time, and before they know it, they are late for breakfast, and sometimes late for school.

But Mary and Billy have found out that even getting dressed can be interesting. They have a game they play that helps them to keep right at work from the time they jump out of bed until they are ready for breakfast. They call it "the step game." Their mother helped them to invent it, and showed them how they could make cards for it.

Each of them has to have twelve cards to use in the game, because they dress in twelve "steps" when they play it. The cards they use are what the stores call "filing cards." They are white and measure five inches one way and three inches the other way. A few cents will buy a package at almost any store that keeps stationery. Sometimes they have blue lines ruled on one side, but you can turn them over and use the plain side. They come in colors, too, and you may like to use the blue or the pink ones for your game. Mary and Billy use plain white for theirs.

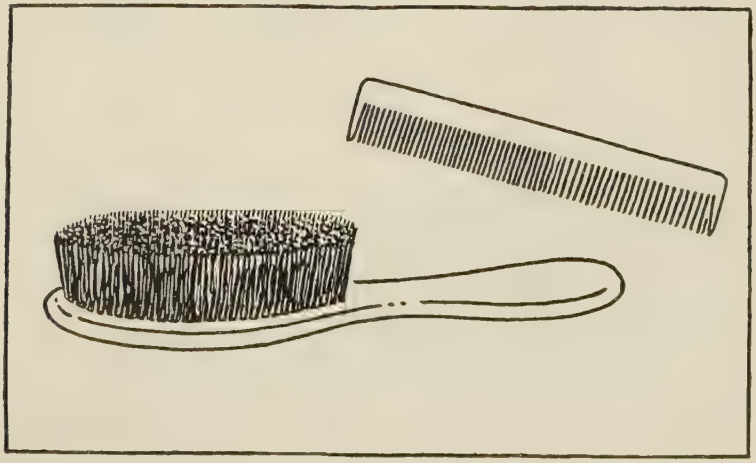
Each card has a picture that tells you the "step" you must take before you can use it. For instance, the stocking step has on it a picture of stockings, and the shoe step has a picture of shoes. You make a "staircase" of the step cards as you go along. Just as soon as you finish a step in your dressing, you take the card for the step and add it to your staircase. The pictures on the first three step cards are a tooth



brush, a glass of water, and a towel with a cake of soap. Mary has a wash cloth on the card with her soap and towel, and Billy has a sponge on his. To look at their pictures, I should say they must both use at least a dash of cold water after they get their scrubbing done, for cold water and a good rub starts the day right on the outside of us, just as a glass of water starts it right inside.

Then after that, each one has nine more cards and nine more steps before the dressing is finished. On the Source Picture you will see that Billy must have at least eight cards more with pictures of a union suit, a waist, trousers, a blouse, a tie, and his stockings and shoes, and of course, he will need still another card with a comb and brush on it. If the weather is cool, he will need his sweater too, so he probably has a card with the sweater that he can add if he needs it. Of course he would hardly wear his cap at the breakfast table, so that must be left out of the staircase, unless, perhaps, he gets it out and puts it with his books so as to be all ready for school.

As for Mary you can see that her cards will have pictures of a shirt, drawers, waist, bloomers, stockings, shoes, and a dress. I dare say she wears a hair ribbon too. At any rate she will have a comb and brush card. If she does not wear a hair ribbon,

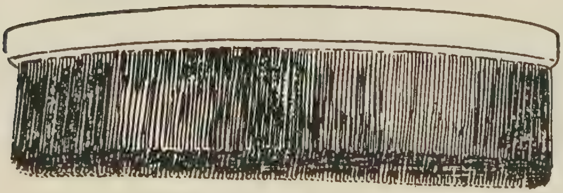


then it must be that little neck ribbon on her dress makes the last step, for you know the game would hardly be fair if she had one less step than Billy had. If it is a cool day, she has to put on a sweater too, so she must have a card with a picture of one that she can add when she needs it. Perhaps she gets her coat and hat out of the closet, and puts them where they will be ready when she wants them, after breakfast. If so, I suppose she has the pictures on a single card to match Billy's cap, for, of course, the game wouldn't be fair if she should have one more card than he has, even though no real dressing should be needed to go with it.

Well, you can just imagine how fast Mary and Billy used to get dressed when they first began playing the step game. They dressed like lightning and got so excited trying to finish their staircases first, so as to win, that Billy got his shoe laces all knotted up, and sometimes Mary could not eat her breakfast afterwards, and the one who lost was apt to get pretty cross. So that was no way to start the day. Still, they couldn't bear to give up the game, and begged Mother to show them how they could play it without getting so excited. "We must invent something that will slow us up," said Mary.

"And give me a chance with my shoes laces," said Billy.

"And give me children who are properly washed and dressed when it is over," said Mother.



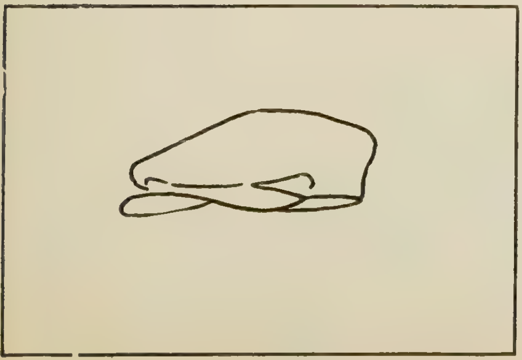
And so they all tried to think of some way to make a better game of it.

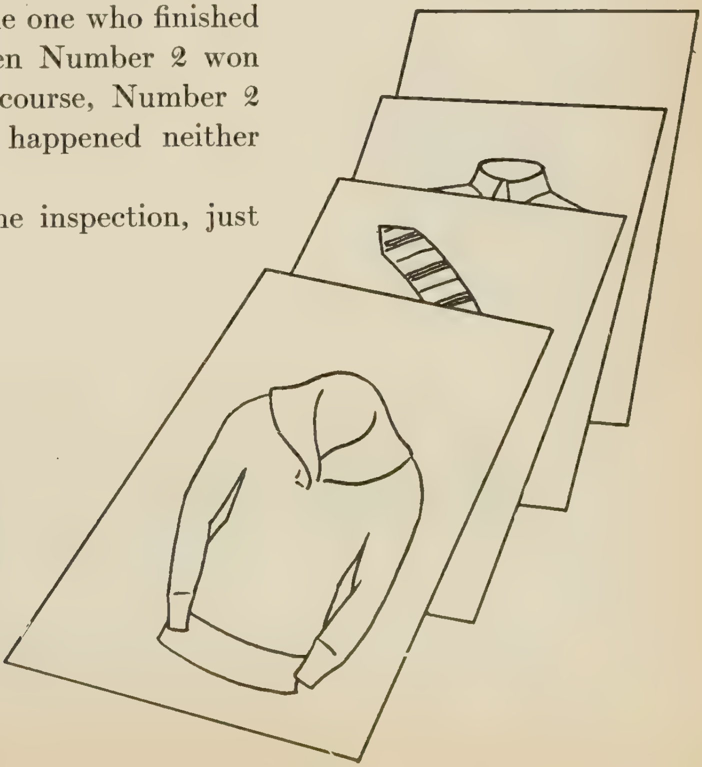
"We might make a rule that the winner has to pass inspection," Mother suggested. Neither Mary nor Billy knew what "inspection" meant. So their Mother told them about it,—how men who wear uniforms, soldiers and sailors, and policemen and firemen and some others, have to pass inspection. Each day when they are all dressed in their uniforms they stand in line, and their officers look carefully at each one to see that he is perfectly neat. Nobody must forget to brush his coat or blacken his shoes. All the belt buckles and brass buttons must be bright and shiny, and of course everybody must have clean hands and face, and there must be no holes in their clothes or any buttons missing.

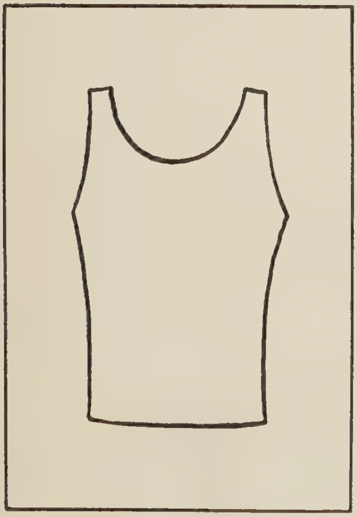
"The officers are very, very strict about such things. Nobody can march in a parade or go anywhere in his uniform unless he has first passed inspection," said Mother.

Mary and Billy could see that to have inspection would make their game a much better one, and a much fairer one too. So they asked Mother to inspect them when they were dressed. If the one who finished first could not pass inspection, then Number 2 won the game for that day, unless of course, Number 2 failed to pass inspection. If that happened neither child could win.

Mother was very strict about the inspection, just







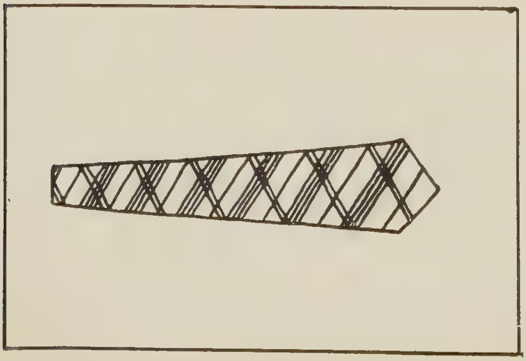
as strict as an officer could be. She looked to see if you had remembered *everything*,—ears, neck, finger nails, hair, shoes, and you had to report too, about brushing your teeth and drinking your glass of water.

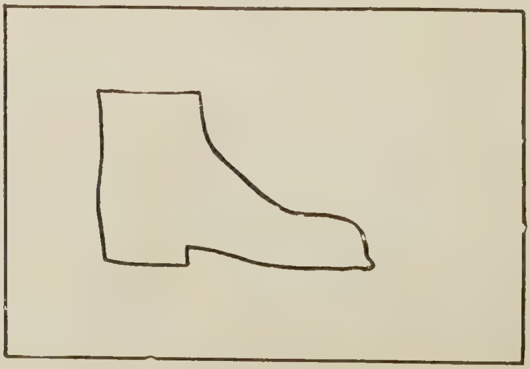
As soon as they began to have inspection the game slowed down a good deal. The dressing improved and everything was better except for Billy's shoe laces. They took so much more time than anything Mary had to do, it really was not fair. So to even up the chances they decided Billy would have to be given a little extra time.

"Then Mary will have a handicap," said Mother. "That is often done in races and games. The person who has the better chance of winning is given a handicap."

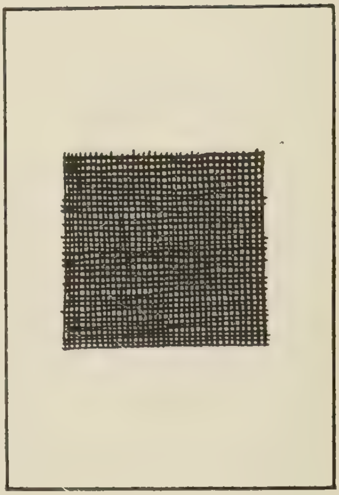
So Billy was asked to put on his shoes and lace them up as fast as he possibly could. It took him just five minutes to do it. Then Mary put on her shoes and buttoned them as fast as she could, and it took her just one minute to do it. So she was given a handicap of four minutes, and every day she waited until four minutes after Billy began the step game before she began. That evened up the chances so well that on some days one was the winner, and on other days the other won. In that way you could tell the chances were really even.

One day Mary thought it would be fun to make some new step cards. For she had used hers so hard they were almost worn out. So she made some with

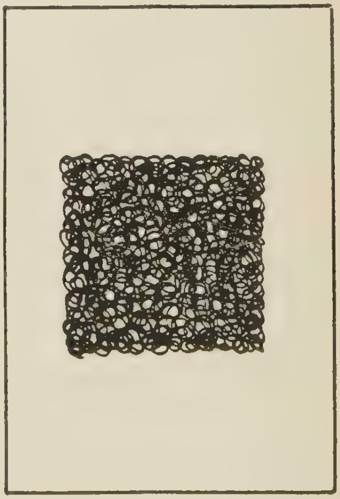




cut-outs on them, and each cut-out was made from a little piece of the cloth that people generally use for that kind of clothing. Like lots of other children, she had ever so many little pieces of cloth that Mother had given her to use when she needed them. So, soon she had some pictures cut out and pasted down on the new cards, and Billy came along and liked the idea so well that he made some too. For the stockings, they cut up a real stocking—one that Mother gave them out of the stocking bag because it had so many holes she couldn't mend it any more. Billy used a tiny piece of striped silk for his necktie, and Mary took pains to get a little piece of the right kind of woolen stuff to make the union suit and the shirt. Mother gave them an old glove to make the cut-outs for the shoes, and they had great fun choosing the cloth for Mary's dress and Billy's trousers and blouse.



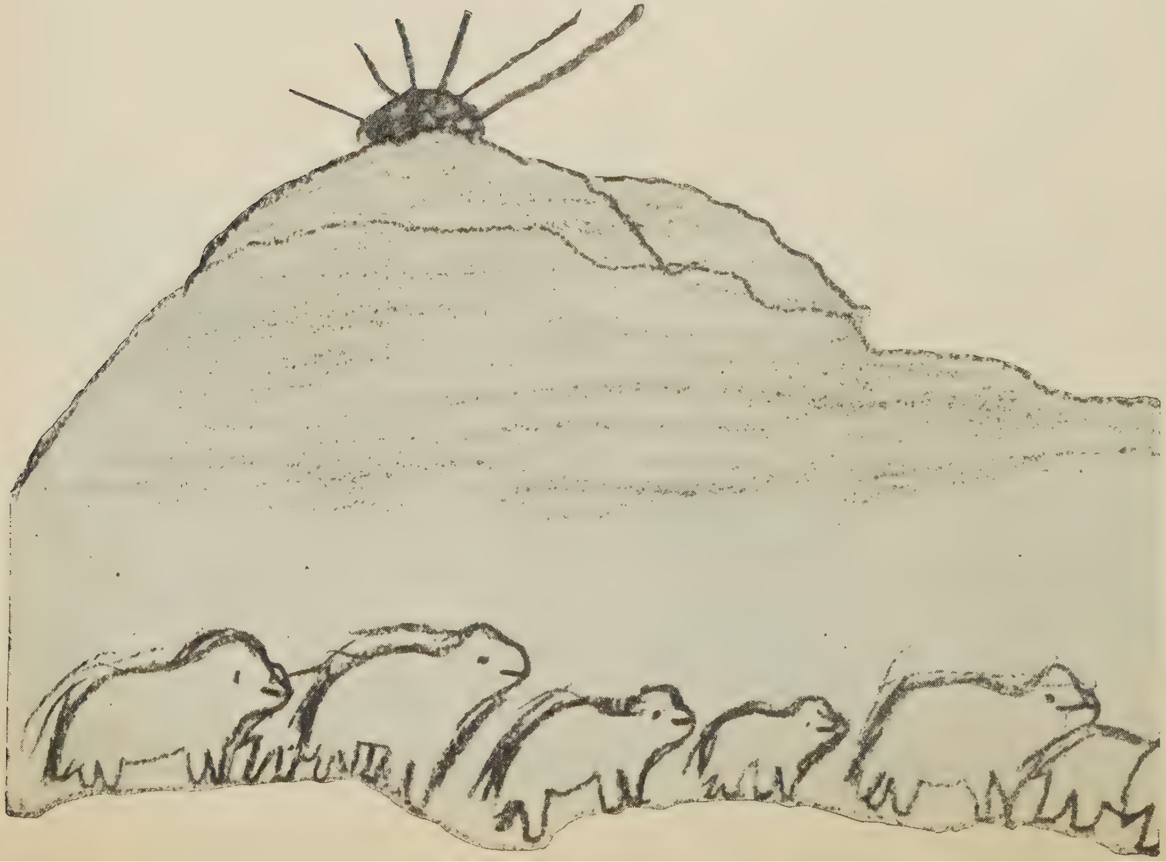
While they were cutting and pasting away, they began to talk about the different kinds of cloth and why they are different. They remembered that cotton grows on a plant, and that silk is made by silk worms and as for wool, they both thought of the same joke at the same time, and said, "Baa, baa, black sheep!" right together.



Then they tried feeling of the different pieces of cloth with their eyes closed to see if they could tell with their fingers whether they were cotton, or wool, or silk. Sometimes they could, and sometimes not. But pretty soon they thought out a new kind of game that you play that way. This they called the "Scrap

Game," because they just took a scrap of cloth and pasted it on a card so it would be easy to feel of it. They cut the scraps in nice square pieces so as to make the cards look as neat as possible. Then after they had made a good many of them, they made some big cards to put in the center of the table. One was a wool card, and one was a cotton card, and one was a silk card. You could tell which was which by the pictures on it, for the pictures showed you just how that kind of cloth is made. You put the big cards down on the table, felt of the little ones with your eyes shut, and said out loud what kind of cloth you thought it was. If you were right, you put the little card on the big one where it belonged, but if you were wrong, you put it in a separate pile, and that counted against you.

Billy made the wool card. He drew three pictures on it. They are the ones you see on this page and on page 55 and page 56. The first one shows you

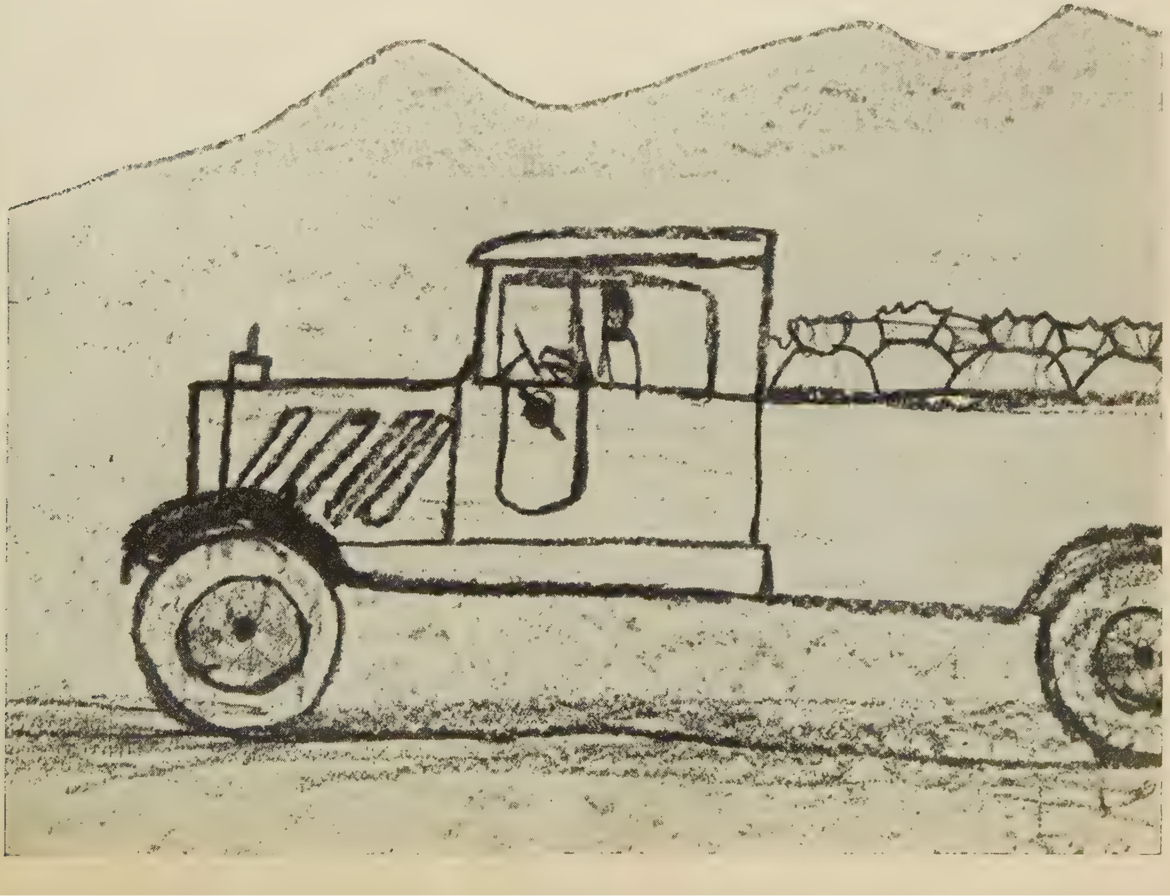


the sheep in the meadow, keeping together in a flock just as they really do. Their legs look short because their bodies are so woolly. "They don't know it yet," said Billy, "but they're on their way to have their wool cut off. What is that word that means cutting off wool?"

"Shearing," said Mother. "They are going to be sheared, and the wool when it has been 'shorn off,' as people say, is called the fleece."

In the next picture you see the wool being taken to be sold. The fleeces have been packed in the big bags that are in the back of the truck. The last picture shows the factory where the wool is made into cloth. It has a big chimney and lots of windows, as factories nearly always have.

Mary made the silk card. She had to ask a good many questions before she could decide just what to put on it. First she made a picture of the white moth that lays the silk worm eggs. Then came a picture of a



leaf from the mulberry tree with the tiny eggs on it. Then came the silk worm getting its dinner by eating the mulberry leaf, and then the silk worm spinning its cocoon. Then there was a picture of the cocoon all finished and last of all, the picture of a skein of silk and some little squares of silk and satin pasted on the card.

Perhaps you can guess what was on the cotton card. In the middle there was a cotton field with people in it picking the ripe cotton from the plants. All around the edges were smaller pictures. There was one of the cotton plant, and one of its flower. Then there was a picture of the cotton boll, the seed pod, with the white cotton bursting out of it, as it always does when it is ready to be picked.

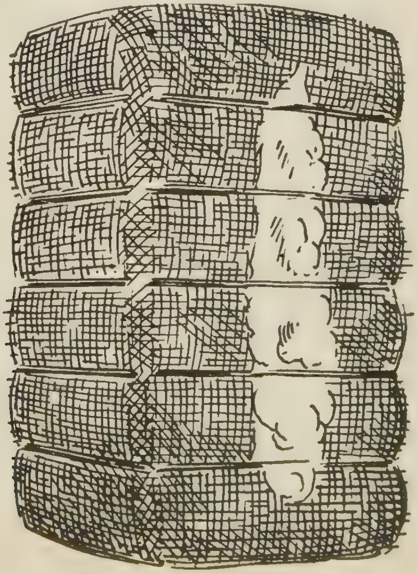
At the bottom of the card there was a picture of a cotton bale, the big package in which the raw cotton

is tied up to be sent to the factory. Next to it was a little picture of a factory and on the other side of that a picture of a spool of thread and then pieces of cotton cloth pasted on, and a little square of cotton batting too.

When they showed the cards to Mother, she asked them why they had left out linen. Both the children had heard of linen, but they knew very little about it. Mary thought that it was just a kind of cotton cloth. So Mother told them about flax, the little plant that has such blue flowers and such strong little fibres in its stems, how people use the flower seeds for making oil, and the fibres for making linen. "They put the stems in water so all but the fibres will rot away. Then they are combed out and woven into linen. Linen cloth is very strong and lasts a long, long time. No one knows who first found out the way to make it, it happened so long ago. But in very old days, it was the finest and most expensive cloth people had. In fact, for many years it was the only cloth that was made except woolen cloth."

"Is woolen cloth the oldest kind?" asked Betty.

"Yes," said Mother, "wool was the very first material that people ever made into cloth. It was so much easier to spin it into thread and to weave it, than it was to make the flax fibres into cloth, that for many,



many years nearly everybody wore clothes of woolen cloth. Very poor people often could not wear cloth at all, and dressed in the skins of such animals as sheep and goats. Only rich people were able to wear linen. I suppose they used to feel very elegant in their linen clothes, those old Kings and Queens of long ago."

"How long ago was it?" asked Mary, laughing.

"It was in the days the Bible tells about," said Mother. "Sometimes the Bible speaks of linen and always as if it were something costly and wonderful. 'Purple and fine linen' is an expression that comes from the Bible. People sometimes use it today when they mean the very best that anyone can wear."

"Well, what is the best that anyone can wear?" asked Billy. "I mean which kind of cloth is the best of all?"

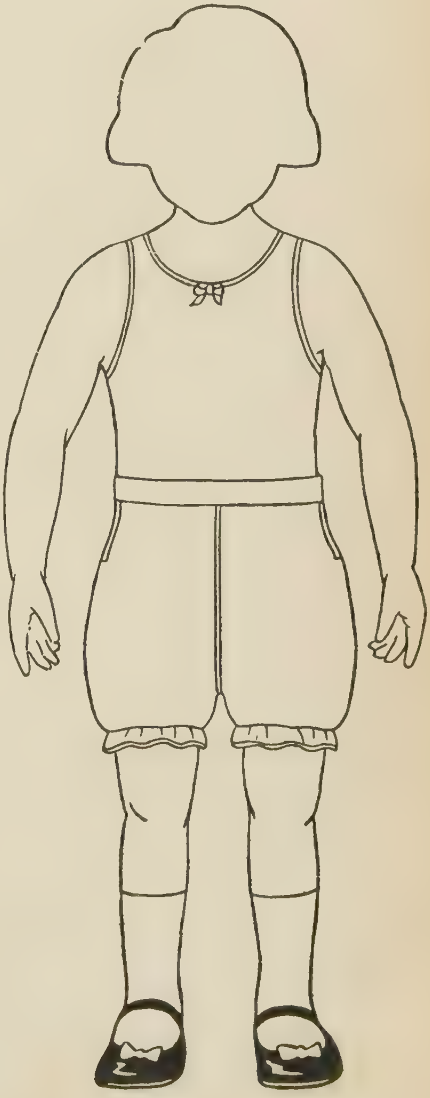
"Silk!" said Mary.

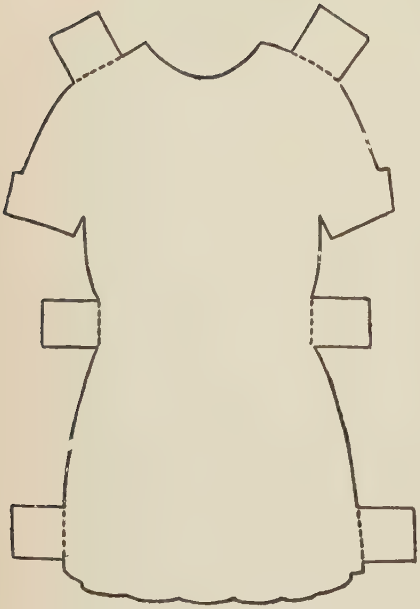
"Many people seem to think so," said her Mother. "But if we had to choose just one and give up all the others, I believe we would find we must choose wool, for that will keep us warm in winter, and it can be woven in such a way that it will be cool to wear in summer as well. For my part I am glad we do not have to choose, but can have the things we wear made from all these different materials. Then we can choose wool to keep us warm, and cotton to keep us cool, silk for its softness and its lustre, and linen for the things that have the hardest kind of wear—collars and cuffs and handkerchiefs, for instance, that have to stand so much hard washing."

When the children made their linen card they put on it a picture of the flax plant with its blue flowers. And they copied a picture of one of the little spinning wheels that people used to use for spinning flax. In one corner Billy put the picture of a sail boat, because sails are made of very heavy linen called canvas, and in another corner he put a picture of a tent, because linen canvas is also the best material for tents. And they pasted on a piece of linen twine too. For all these things reminded them how strong the fibres of the flax must be.

Now I am sure that you will find it fun to invent other games of the kind Billy and Mary made. Try printing the names,—"cotton," "wool," "silk," "linen" in big letters on the center cards. Perhaps you would rather make the small cards more like those they used for their step game, with pictures on them, instead of scraps of cloth that must be named by feeling of them. You could add a "leather" center card, and perhaps a "fur" card if you liked, and the pictures could be drawings or cut-outs just as you pleased.

On page 58 and page 59 are some patterns that are good for making paper dolls. They are drawn with heavy lines so that you can easily trace them on a sheet of paper. Then you can paste them on cardboard and cut them out. As you see, the heads have no faces drawn on them. They have been left

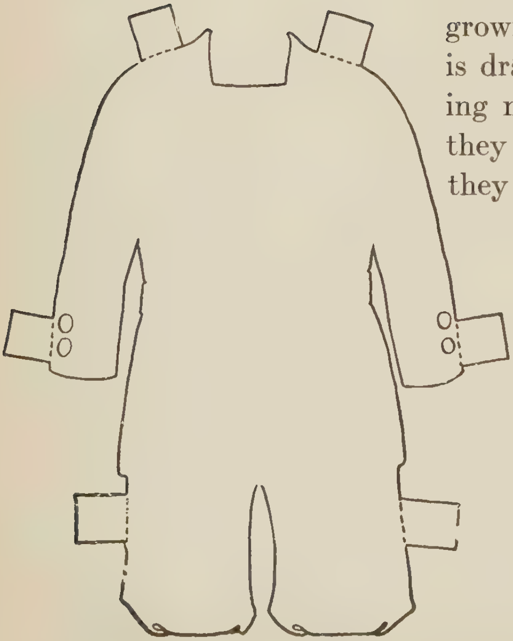




plain purposely so you can have different faces for different dolls. If you turn to Chapter XXIII, and read what it says about drawing faces, it will help you to make faces for these dolls. If you have not yet practiced enough to make a face that suits you, you can surely find some heads that will be the right size in a magazine or a newspaper. These can be cut out and pasted on, and you can make up quite a paper doll family. Try, too, copying the pattern instead of tracing it. See if you can make it larger or smaller and keep the different parts the right size. You can practice this on your drawing board.

The patterns for the girl's dress and the boy's suit are really only "linings" shaped to fit the dolls. You can color them with the wet Hy-San Crayons or with the soft dry ones (No. 80), or you can paint them. But you will need to plan the colors and the styles yourself. Perhaps you will cut the dresses and suits out of real coth or tissue paper, and paste them on the paper lining. Quite elaborate paper doll clothes can be made in that way.

When you make paper doll's clothes you are doing something that grown people call "designing." Many grown-ups make their living designing clothes, that is drawing pictures and patterns of them and inventing new ways of making them. Does it seem to you they must have a good deal of fun at it? I believe they do.



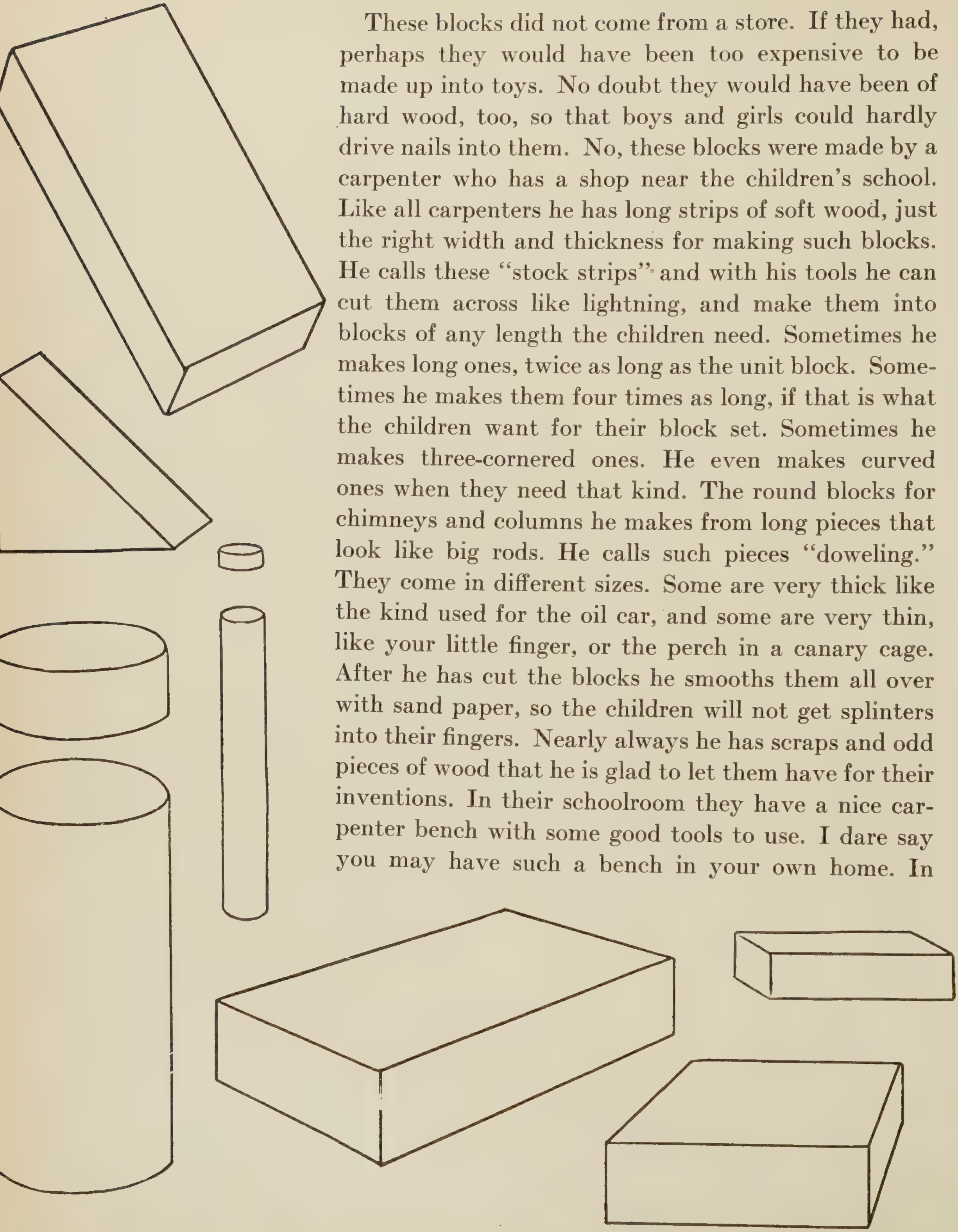
CHAPTER V

How the Children Travel

PART ONE

On Source Picture Number 5 you will see a little boy who has been making floor toys. He is just driving the last nail into his auto truck. All around him are the other toys that he has made. Look at them carefully and you will find that every one was meant to use when "the children" travel. You can see clearly too, that they were meant to pull and push about on the floor.

These toys were invented by some children who go to a school where they have a great many blocks to use. So they are always building and making things with them. They invented the furniture you see in the pictures on page 15. It is made in much the same way, out of "brick-shaped" blocks and "half bricks" and small pieces of wood nailed together. In their block set there are many more of these bricks and half bricks than there are blocks of any other shape. They are the most useful kind for building and for making things. The children's teacher calls them "unit" and "half unit" blocks. There are some round blocks too, in their set. These can be used for columns and for chimneys and things of that shape. You can see two of them in your Source Picture. They make the boiler of the engine, and the tank of the oil car.

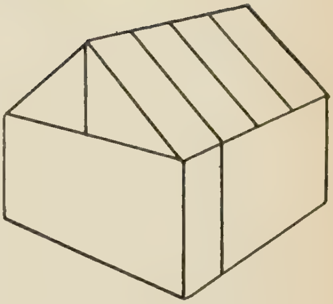


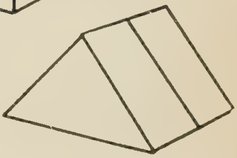
These blocks did not come from a store. If they had, perhaps they would have been too expensive to be made up into toys. No doubt they would have been of hard wood, too, so that boys and girls could hardly drive nails into them. No, these blocks were made by a carpenter who has a shop near the children's school. Like all carpenters he has long strips of soft wood, just the right width and thickness for making such blocks. He calls these "stock strips" and with his tools he can cut them across like lightning, and make them into blocks of any length the children need. Sometimes he makes long ones, twice as long as the unit block. Sometimes he makes them four times as long, if that is what the children want for their block set. Sometimes he makes three-cornered ones. He even makes curved ones when they need that kind. The round blocks for chimneys and columns he makes from long pieces that look like big rods. He calls such pieces "doweling." They come in different sizes. Some are very thick like the kind used for the oil car, and some are very thin, like your little finger, or the perch in a canary cage. After he has cut the blocks he smooths them all over with sand paper, so the children will not get splinters into their fingers. Nearly always he has scraps and odd pieces of wood that he is glad to let them have for their inventions. In their schoolroom they have a nice carpenter bench with some good tools to use. I dare say you may have such a bench in your own home. In

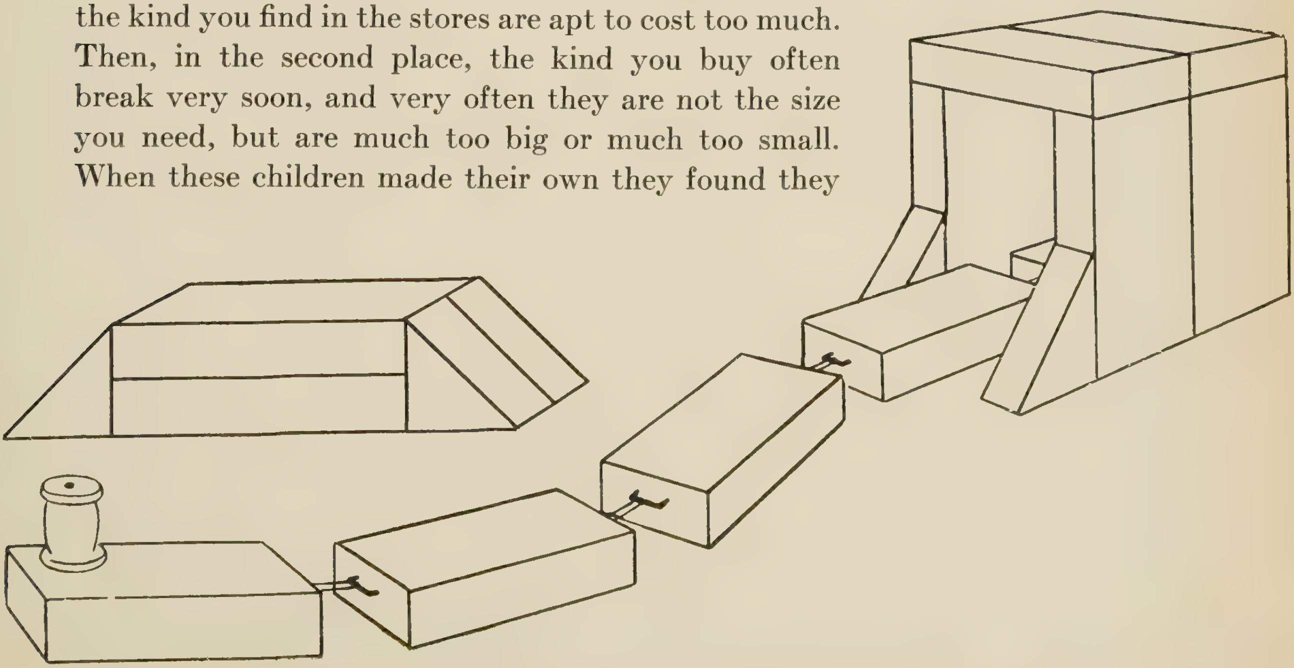
Chapter XIX you can read about some of their tools and when you have done so, you will understand how it is that these children have been able to invent such interesting things.

When they build with their blocks, they sometimes make farms, with houses and barns, and silos and chicken coops, and all the different buildings that a farm needs to have. They put fences around the fields, and sometimes they have a railroad going by, with a station, and tunnels, and bridges, all made of blocks. They make the railroad tracks with their blocks, too. And of course they need to have trains for their railroads, and horses and carts and autos on their farms. On some days they make whole villages, with houses and stores, and churches and factories, and garages and all the other buildings that a village needs. And of course they need to have autos, and trucks and trolley cars, as well as horses and carts for their streets. Then sometimes they need boats very much. The boats have to be made so that they can sail them on the floor.

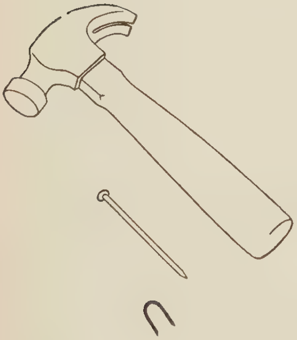
Now you will see how they came to invent all these floor toys. They found they must make their own because, in the first place, they wanted a good many, and the kind you find in the stores are apt to cost too much. Then, in the second place, the kind you buy often break very soon, and very often they are not the size you need, but are much too big or much too small. When these children made their own they found they



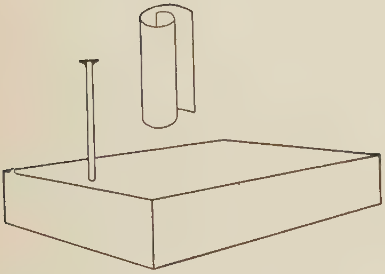




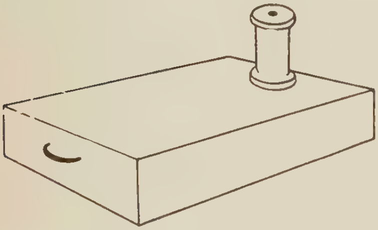
could have a great many different kinds, just as many different kinds, indeed, as they could invent, and they could always make them the size they wanted.



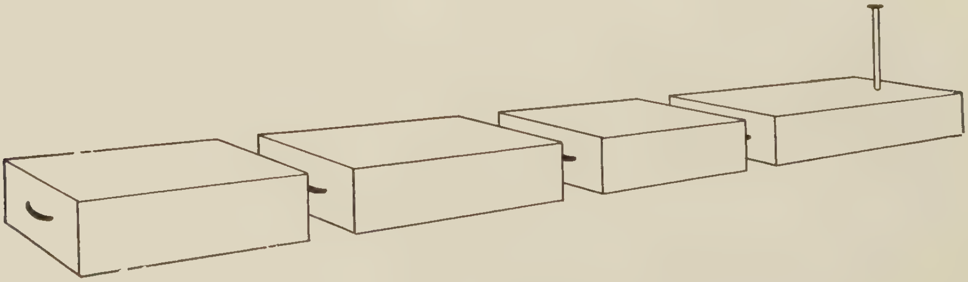
In the beginning they only made toys that were very easy to make. But they were very good to play with for all that. You can see some of them on this page and the next one. One of the very first things that they invented was a railway train. They took their brick shaped blocks for the cars, and drove staples into each end. You will see the picture of a staple on this page next to the picture of the hammer. Then they tied the blocks together with string run through the staples. In this way they could make very long trains. A big nail could be driven into one of the end blocks to make a smoke stack, and that did for an engine. For the coal car, next to the engine, they used to use a half unit block. Sometimes they would slip a spool over the nail in their engine, and that made a better smoke stack. And sometimes they rolled a piece of paper and pasted the edge down, and that made a still better smoke stack.



Sometimes they made tug boats in the same way, using a nail for the smoke stack, or a spool, or a roll of paper. Now and then they would put one or two half unit blocks on top of the unit block, and build up a high cabin of the kind a tug boat really has. Then they would put the smoke stack on top of that.

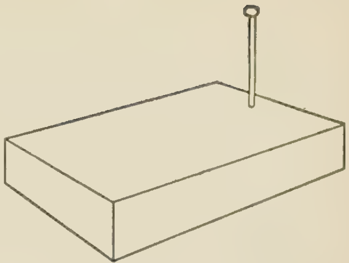


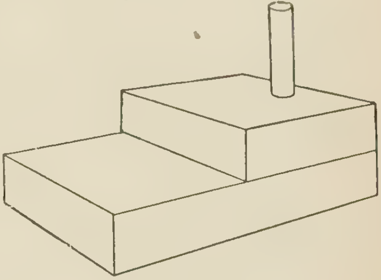
If you look at the Source Picture you will see the way they made their carts and horses. Each horse was made

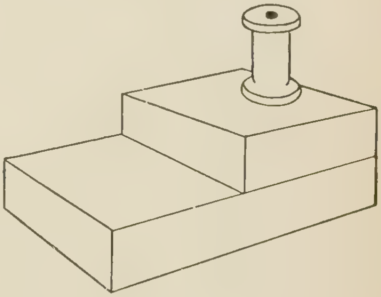


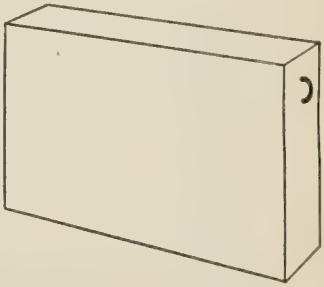
out of a unit block. A staple was driven in the front end near the top, to make a bridle and hold the reins in place. They made the reins out of string. The wheels of the cart were made out of big wooden button molds. You find these at the button counter or the notion counter of a dry goods store, or in one of the little stores where they cover buttons with cloth. A few cents will buy a good many of them. The Source Picture shows you how they can be nailed into place. The driver's seat is just a little piece of wood nailed to the top of the block. You can use a cart like this for a truck or a farm wagon, or you can have only one horse and pretend it is a grocer's cart or a milk wagon. If you use it for a milk wagon you can stand some empty spools on the back part for milk cans. You can invent different ways of harnessing the horses. In the picture you will see there is a staple driven in the front end of the cart, and a string is tied to it. This is fastened to the horses' harness in front. So if, instead of letting the reins lie on the horses backs as you see them in the Source Picture, you should take them and pull the horses forward with them, the horses will pull the cart forward too.

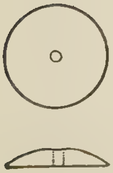
The automobile in the Source Picture is made in very much the same way as the cart. It has a staple driven in the front of it, so if you wish you can pull it by a string. The "California top" is made out of a piece of cardboard tacked to the back of the block with tacks, and held down in front with two long nails that are driven into each end of the driver's seat.

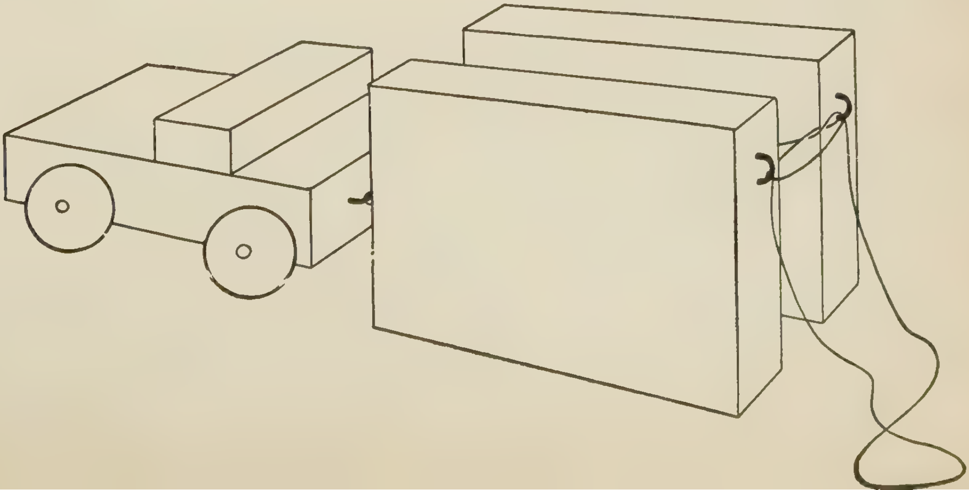


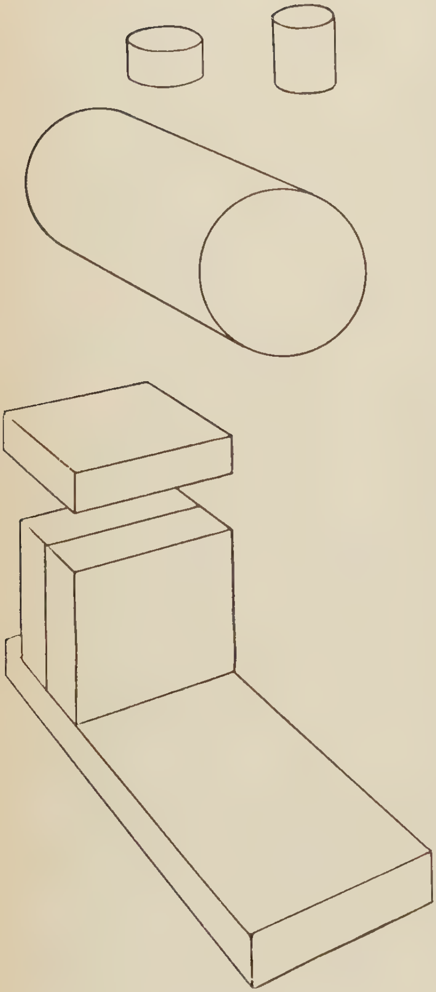








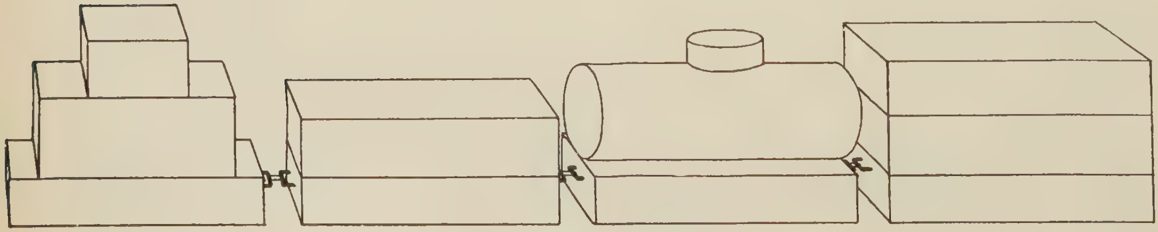




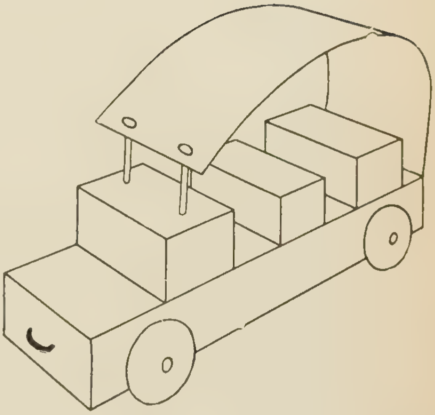
The little boy who made the auto truck did not care about wheels as you will see, or perhaps there were no more button molds the day he made it. He used a long piece of wood for the bottom of his truck, and put two unit blocks on top of it to make the sides. Then he nailed on a piece of wood for the roof. He might have used cardboard just as well for that. Two small pieces of wood nailed on in front make the hood and the driver's seat.

The engine of the railway train on the Source Picture is harder to make than the kind I have already told you about, the kind the children made at first. If you should wish to make one like it, you would need a piece of the big doweling for the boiler, and two pieces of smaller doweling for the smoke stack and the sand dome. The cab is made of two half unit blocks with a small piece of thin wood for the roof. The piece of doweling that makes the oil car is nailed on top of one of the unit blocks, and the "box car" that comes after it is made by just nailing two unit blocks together.

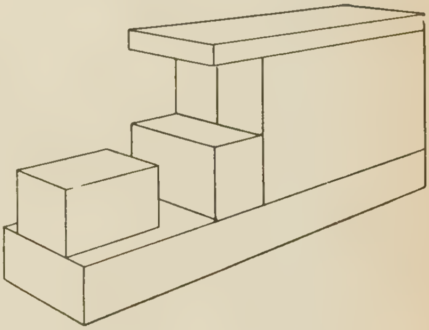
Children who have no block set, or who cannot use the blocks in the set they have for making floor toys, can easily get a carpenter to cut them a few units and half units from some of his stock strips. Or perhaps they can cut their own pieces with a saw from odds and ends of wood, and they can always invent different ways of getting the same effects. For example, the smoke stack on the engine could easily be made out of an

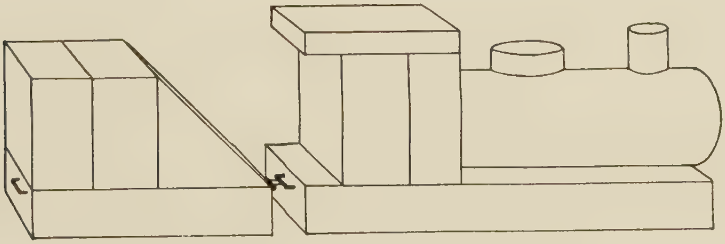


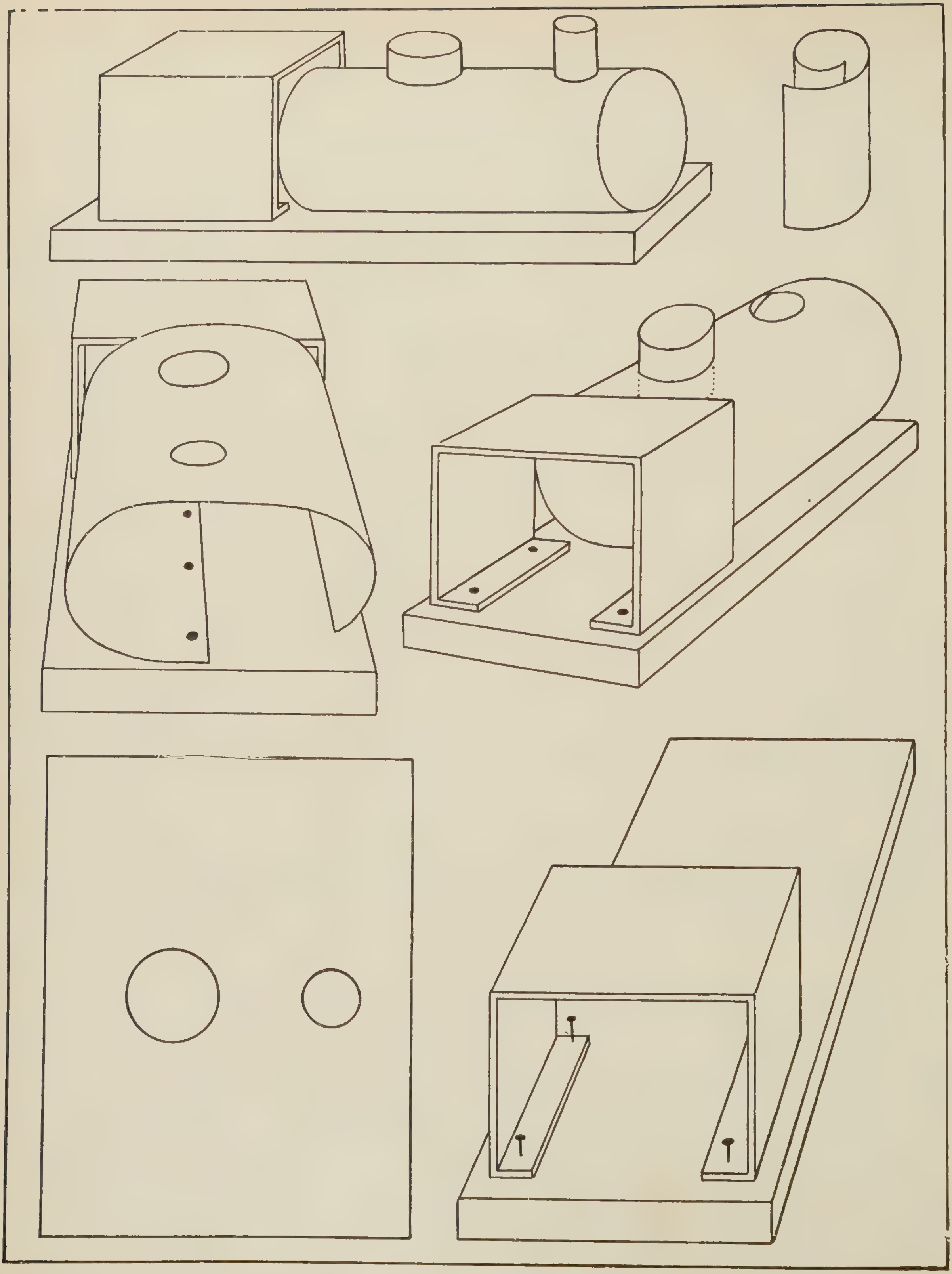
empty spool, and the sand dome could be made out of one of the short spools that are used to hold silk twist. Or the boiler could easily be made out of a piece of cardboard, rolled and nailed in place on a flat piece of wood, as you see in the pictures on page 68. Both the smoke stack and the sand dome can then be made of rolls of paper, slipped into holes cut in the top of the boiler. The cab of the engine can easily be made of cardboard or of corrugated paper, bent and nailed into place as the drawings show. In fact making floor toys is very much like making the furniture in the house "Where the children live." You can nearly always invent different ways of making the things you want, out of the materials that you happen to have.



The little girl who made the sail boat in the Source Picture had only an old box lid, some rough sticks, a big nail and a jack knife when she began to make her boat. First she hammered the nail into the middle of her box lid and made a hole for the mast. Then, with her jack knife she sharpened the end of the longer stick so it would fit into this hole, and that made the mast. Then she took a little piece of string and used that to fasten the smaller stick to the top of the mast as you see on page 69. In that way she made what sailors would call a "yard arm." She made the sail out of a piece of white cotton cloth, and when she had fastened that to the yard arm, she cut out a flag and fastened it with a big nail at the stern of her boat. When it was

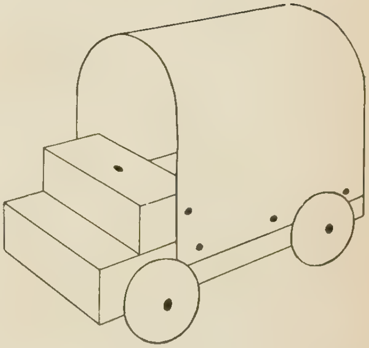




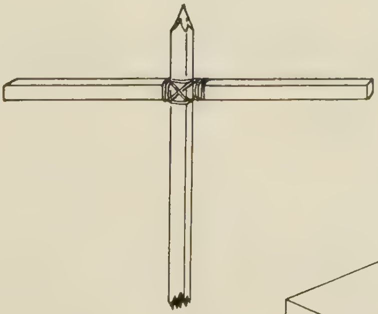


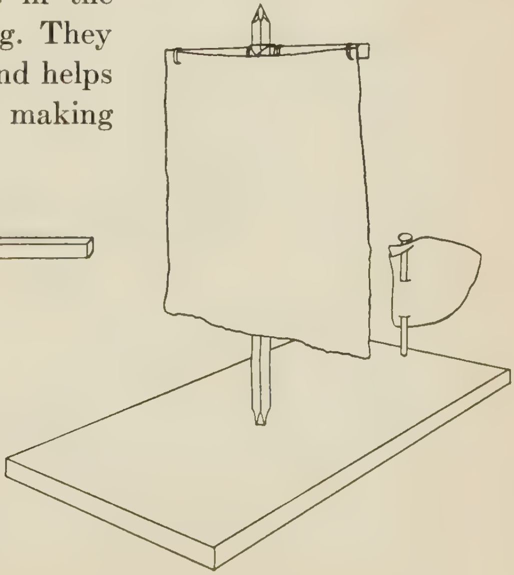
finished she found that it was really a very satisfactory boat to play with. She sailed it all over the floor of her play room and had a great deal of fun with it.

When you have once begun making these floor toys and thinking about all the different ways in which the children travel, you will find you can invent a great many more than I can possibly tell you about here. You can make elevated trains, for example, and trolley cars. I know a little boy who made a wonderful bus with seats on the top of it, and a stairway to climb up to them, and windows in the sides so the passengers could look out. And another boy made a covered wagon. Do you know the kind I mean? It was the kind in which American children traveled with their parents when they went to the great West, years and years ago. There were no railroads in those days. The only way you could travel across the great plains and over the high mountains, was in a covered wagon. It was really your home that you lived in and took with you wherever you might go. I am sure you will be able to think of other things just as interesting and even harder to make than the bus and the covered wagon.



But no matter how many of them you may make or how interesting they may be, you will also want to draw pictures of the different ways in which the children travel. The children who invented the toys in the Source Picture always do a great deal of drawing. They have found out that drawing things of this kind helps you when you come to make them, and that making





them helps you too, when you come to draw them. So when they go out walking they notice how things are made. They notice the trolley cars for instance, and the different kinds of trucks, and they look at all the different railway cars that they see in the freight yards. Then, when they come home, or when they go to their school, they draw all these things and see how real they can make them look, and how much they can remember about them. Sometimes they try drawing things in different positions. One boy likes to make pictures of a locomotive coming toward him. Do you think you could do that? Or could you make a picture of the back of an automobile? On this page you will find a picture that a big boy drew of one of the very first railway trains on which children ever traveled. What a funny engine it has, and how much the cars look like old fashioned carriages! Indeed they used to be called "coaches," and some people still call them that today.

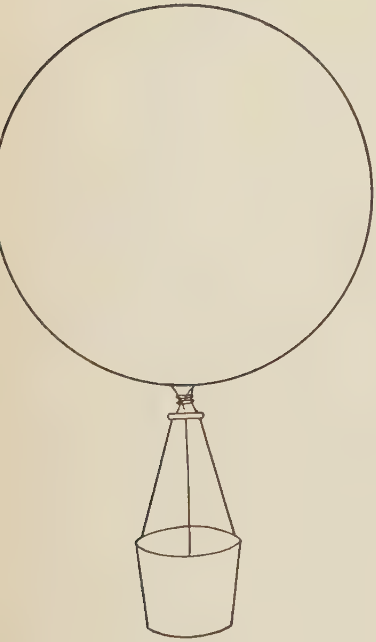
CHAPTER VI

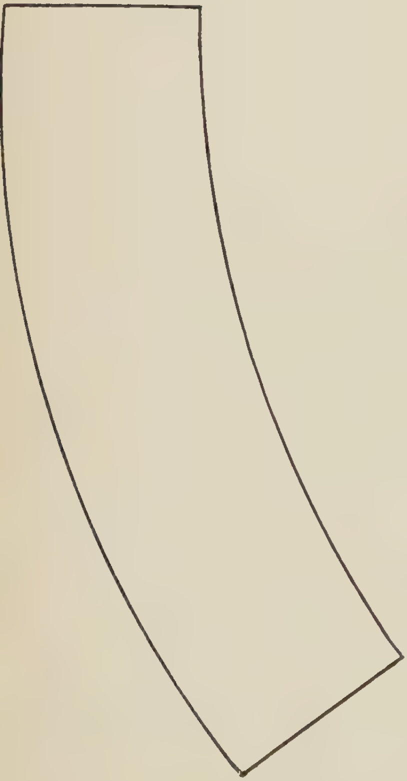
How the Children Travel

PART TWO

SOMETIMES the children want to sail on the water, sometimes, too, they may wish to sail through the air, for that is the latest and most exciting of all the ways to travel. The boats on Source Picture Number 6 can be sailed on the water, as the little corner picture shows, and they can sail on the floor as well. The aeroplane and the balloon were made just for the fun of it. They look very real, but cannot be expected to travel through the air as the boats do through the water. To be sure the balloon can be tossed up, as the boy in the same picture is tossing his, and make a good landing afterwards, and a good landing is very important when people travel by air.

The balloon is one of those rubber ones that you blow up yourself. A rubber band, snapped around the opening, keeps the air in. The basket is made of cardboard and tied on with string. The pictures on the next page show how it can be cut and put together. The strings must be just the same length or the basket will not hang right. If you should use a gas balloon of the kind you buy from the balloon man, there would be no need for tossing it up, for a gas balloon will go up into the air by itself and is likely to get away from you entirely,

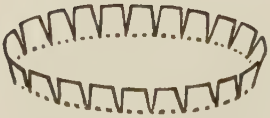


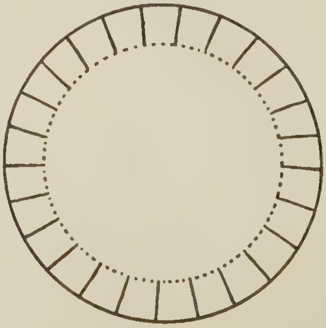


unless you keep it on a string. I wonder if you know or can think of the reason why. The basket may be too light to hang down properly and keep straight, unless some ballast is put in to weight it. A few pebbles will do instead of the sandbags that real balloons carry for ballast, and a paper doll or two put into the basket as passengers, will add to the fun of the gas balloon.

The aeroplane can be made entirely of cardboard, or of cardboard and corrugated paper, or the body can be shaped from a thin piece of wood with a jack knife. Very small brads should be used to tack the parts together, or they can be glued. The star at each end of the upper wing shows that this aeroplane belongs to the United States. The under wing has the same marking, so that people can tell whose plane it is, if they look up and see it in the air above them, and at the same time people who may be traveling through the air above the plane, can look down on it and tell whose it is. If you owned your own plane, you would have to have some special kind of marking on it, to show it belonged to you. So when you make this one, you may find it interesting to invent your own marking for the wings. The pattern on a real plane needs to be very clear, and to be put on in strong colors, so that it can be seen at a distance when the plane is rushing through the air at top speed.

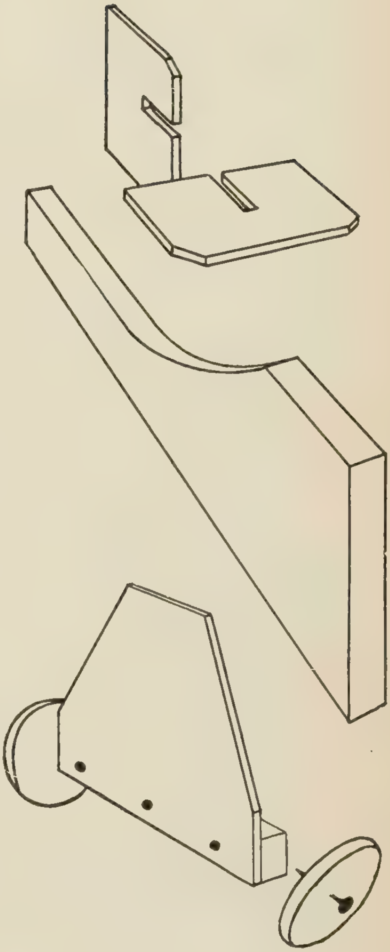
The very first children who traveled in America were the little Indian boys and girls. They traveled long before there were any trains, or autos, or covered

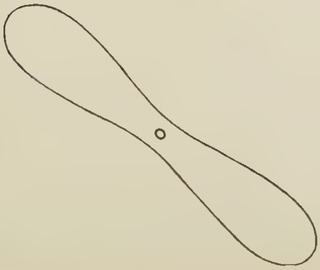


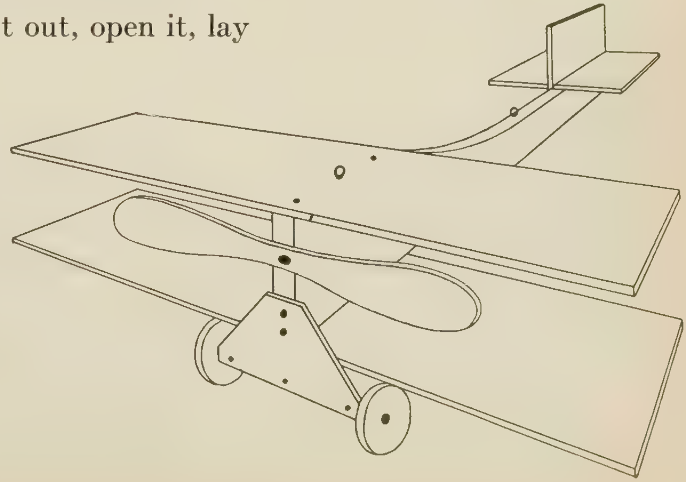


wagons, to take them and their parents to the places where they wanted to go. There were not even horses in those days, for horses were first brought to America by the white men. So when they were very little, the Indian boys and girls were put in their Indian cradles, and carried on their mothers' backs. When they grew bigger, they must often have walked the whole way. But if their parents wished to travel very far, they went by water in a canoe. That was the best and easiest way to get from place to place in the old times, before there were any roads across the open plains, and through the great forests. The rivers were the roads in those days, and the Indian canoes, made from the bark of trees, were the very best means of travel those boys and girls ever knew.

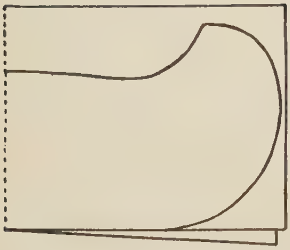
On Source Picture 6 of your Scroll, you will see a canoe that is not made from the bark of trees, but from tar roofing paper, something you can always get at a hardware store. A big piece of it costs only a few cents. The pictures on page 74 show how to make the canoe. Begin by cutting a pattern from a piece of newspaper or wrapping paper. Double the paper so as to make both ends of the canoe alike, then draw the pattern as you see it there and cut it out. This gives you one side of the canoe. You will need to make a second pattern that will give you both sides, so take a larger piece of paper and double it the long way. Lay the first pattern on it with the bottom of the canoe on the fold of the paper, and mark around it with a pencil or a soft crayon. Then cut it out, open it, lay

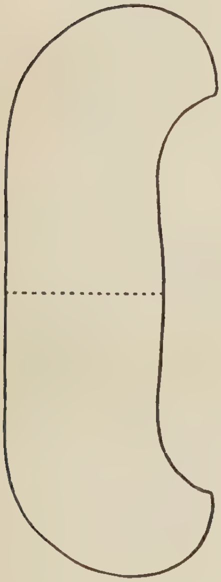




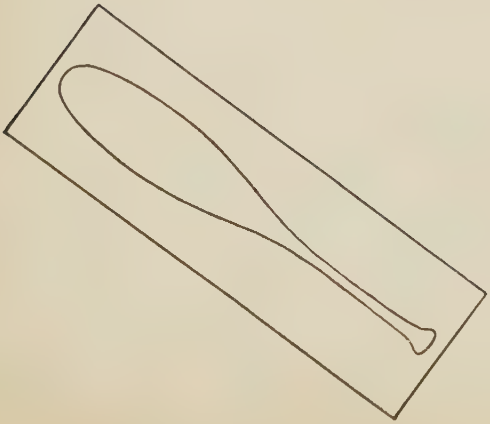


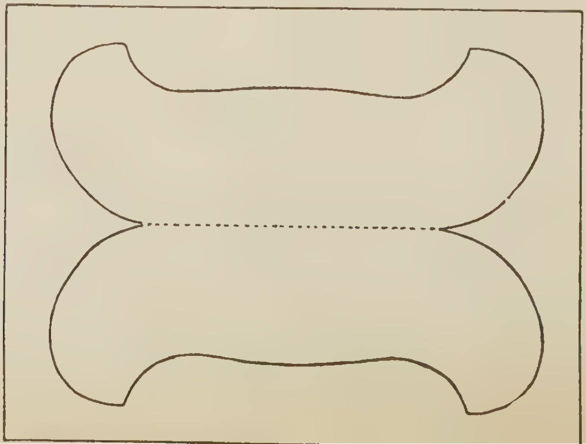
it on the tar paper, and mark the outline with a soft white crayon, or a soft black lead pencil. You will need a strong pair of scissors or a sharp knife to cut the tar paper, and you may have to ask some grown up person to help with the cutting. When you have it cut out, bend up the sides of the canoe and make the two halves of each end come together. You might use paper clips to hold them in place until you can sew them. The sewing must be done with a big darning needle and very strong thread, like shoe thread or carpet thread. It is hard work because the tar paper always makes the needle sticky. Not many stitches are needed, however, and as soon as the sewing is finished the canoe can be used as a floor toy.





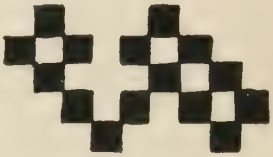
If you wish to sail your canoe in water, you must make it water tight, or as the sailors say, you must "caulk" it. Real boats always have to be caulked. The simplest way for you to caulk your canoe, is to use an old candle end, or a piece of the paraffin that comes on top of a glass of jelly or jam. If you use a candle, you can light it, and let the melted paraffin drop into the cracks on the inside of the canoe, where the ends are sewed together. Let it run in drop by drop, and as it hardens it will seal up the cracks, so that water cannot come in. If you use a piece of paraffin from a jelly glass, melt it in a little pan on the stove and pour it in, or brush it in, with a flat paint brush or a wad of rag. If you find the water beginning to come into your boat after you have sailed it for awhile, you can always caulk it again with a few





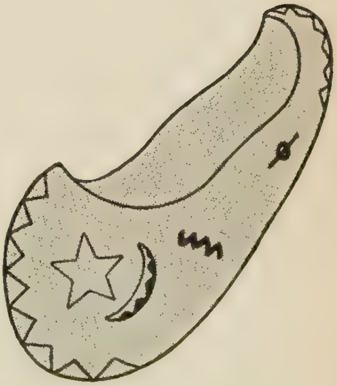
drops of paraffin. A real boat has to be caulked every now and then.

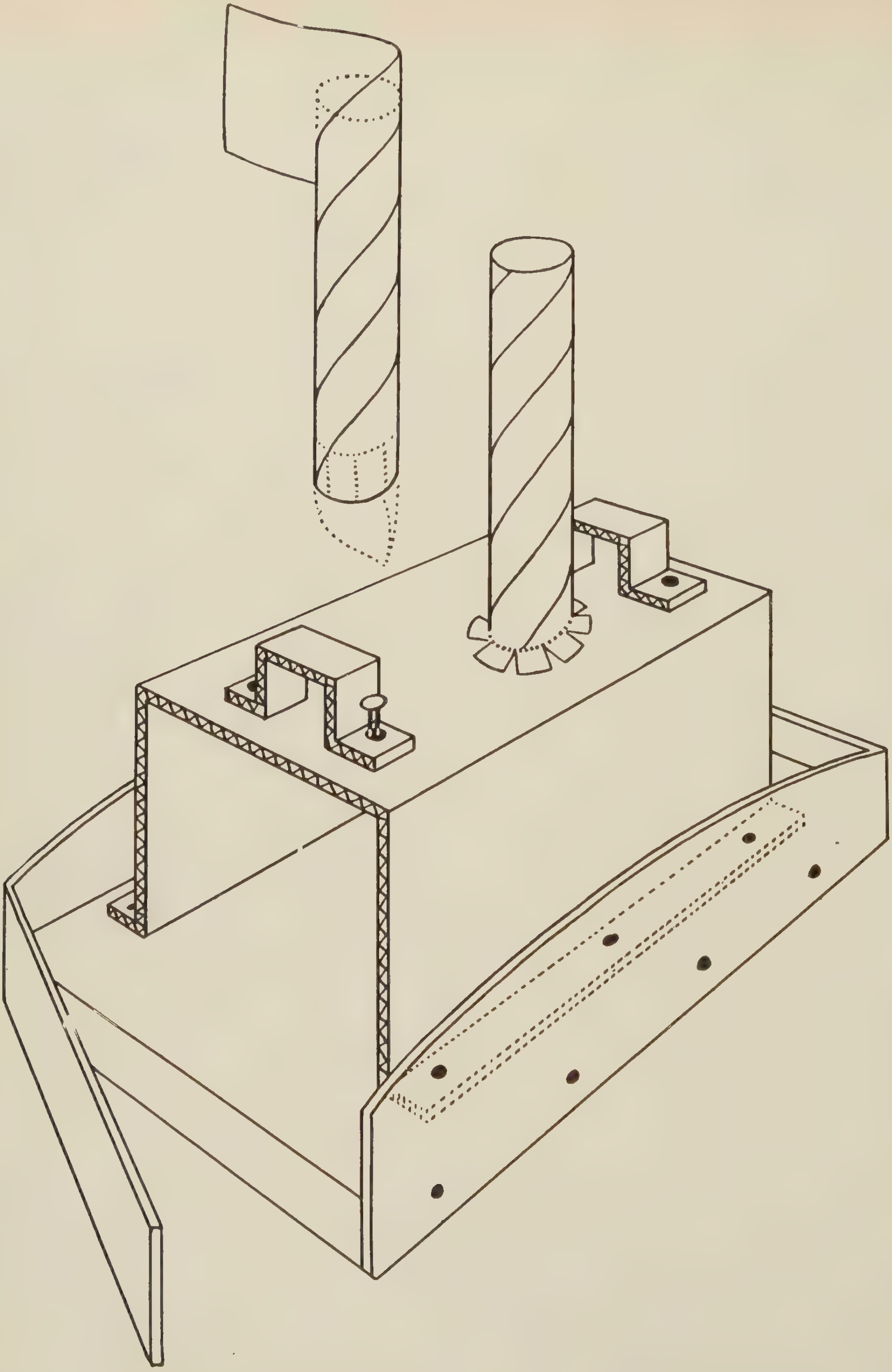
You will probably want to decorate your canoe, and you may want to paint it all over. The Indians never painted their canoes all over, as we paint our boats, but they used to decorate them with curious Indian designs. The canoe in the picture has some of these designs on it, and there are some others on this page that you may like to use. But if you sail your boat in water, you must expect the Hy-San colors to wash off, as all water colors do. A little common house paint can be used very nicely on the tar paper, if you happen to have some, and that will be water-proof. The tar paper itself, however, makes a very nice looking boat without any paint.



When your canoe is finished you will find it can carry quite a load. Indeed it is very like a real canoe because, while it is light and simply made, it can carry a great deal. If you happen to be at the seashore or near a lake, try loading it with sand or with pebbles and see how much it will really hold. You will find it a very steady little boat too, not nearly as "tippy" as a real canoe in which, as you probably know, children have to sit very still when they travel.

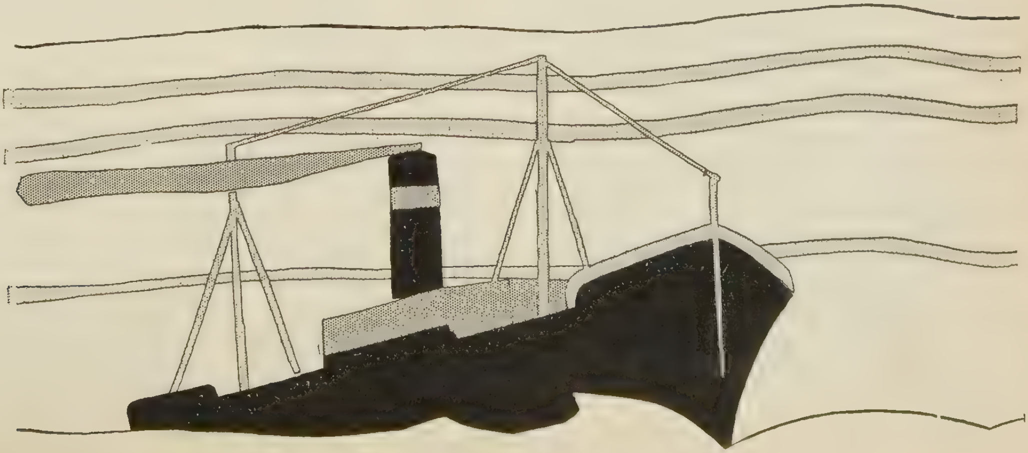
If you have read the beautiful story poem about the Indian boy, Hiawatha, you will remember that it tells how he built a canoe, and asked the different trees of the forest to help him. He asked the birch tree for its bark, the larch tree for its threadlike roots, and the fir tree for its sap, its "balm" as he called it. If

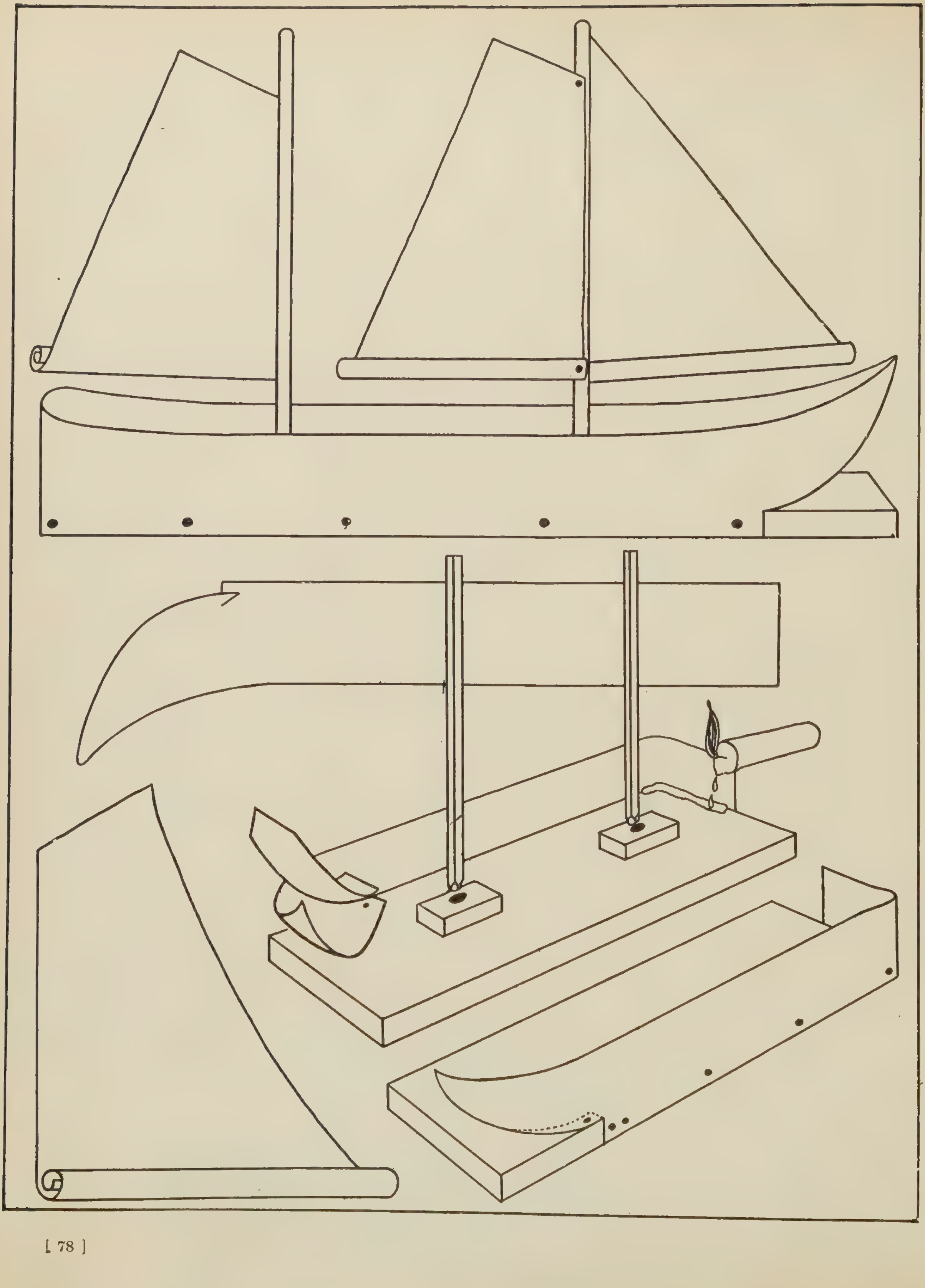




you make this little toy canoe you will use the tar paper instead of birch bark, thread instead of the larch tree's roots, and paraffin instead of sap, but it will help you to understand just how Hiawatha used his materials, for you will be using yours in almost the same way.

To make the ferry boat you will need a flat board, some corrugated paper, and some strips of tar paper for the sides. The pictures on page 76 show how to put it together. The corrugated paper is bent and tacked to the plank, to make the big cabin, or shelter, in the middle. The two ends of a canoe are just alike and so are the two ends of a ferry boat. They are not shaped into a bow and stern, as the ends of other boats are shaped. The bow of a boat is the narrow end, the front of the boat, that cuts the water as she goes forward, but the ferry boat has to run backwards and forwards, and be able to push either one of her ends into the slip at the dock, to let passengers on and off. Then, when she puts out of the dock again, she has to be able to start on her next trip without stopping and turning around. The smoke stacks of this ferry boat are made of paper, rolled as you see, and pasted with a drop of glue. At the bottom they are slit into several parts, which are spread out and glued down to the top of the cabin. The two pilot houses are made from strips of the corrugated paper. Holes are put through at the ends of each strip, with the points of the scissors, and through the roof of the cabin beneath. Then paper clips are run through and



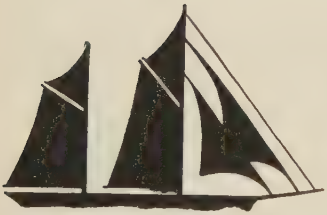


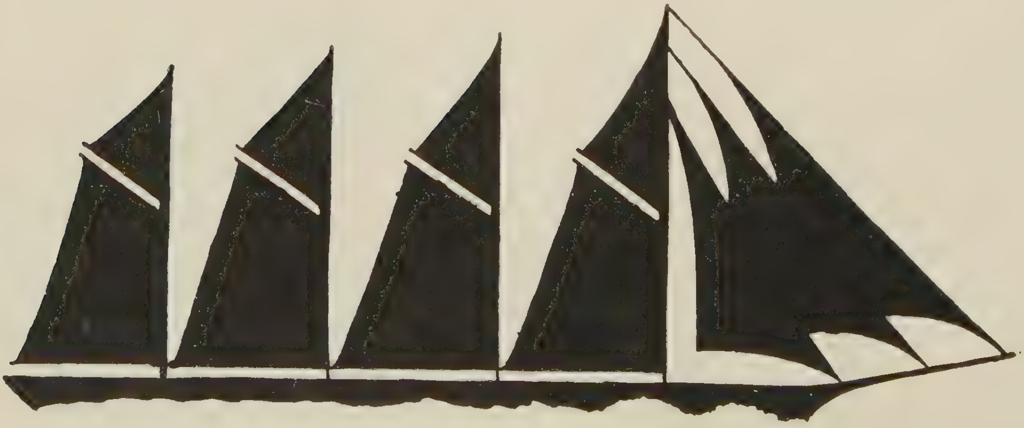
bent back inside the cabin roof, to hold the pilot house in place. After the boat has been put together, she can be caulked with paraffin along the edges, between the board and the tar paper strips at the sides. Then she will be ready for a trial trip on the water.

The sail boat on the Source Picture is also made from a small piece of board and some tar paper. Two strips of the tar paper make the sides of the boat. They are shaped as you see in the pictures on page 78, and are nailed to the board with brads. At one end they are lapped together to make the stern. At the other end they are brought up from the board as the picture shows, to make the bow, and an extra piece of the tar paper is slipped inside to help hold them together and make the bow stronger. The inside of the bow, and the cracks all around this extra piece of tar paper, are well caulked with paraffin, and so are the cracks all around the sides and stern of the boat, where the tar paper is nailed to the wooden bottom. Two pieces of wood, split off from another board, make the masts. These are sharpened at the ends, and fit into holes made in the two small pieces of wood that you see glued to the bottom of the boat inside. The sails are of wrapping paper and are held in place by tiny tacks. The wrapping paper folded over and over at the bottom, makes a good boom. You may wish to rig your boat with sails of cloth. If so,

you will need to make the boom out of a small stick or a piece of cardboard, and another stick will be needed for a "yard arm" to hold the sail at the top.

The little boat on Source Picture Number 5 has its sail rigged across the mast, but the sails on this two-masted boat are rigged "fore and aft," as the sailors say, that is, from the forward part or bow of the boat, toward the "aft" or stern. Do you know the name of the three cornered sail in front? Sailors called it a jib. Sometimes another is put just above it, and that is called the "flying jib." Each sail on a boat has a special name of its own. The boat in the picture, for instance, has a foresail and a mainsail. The foresail is the one that is "forward" in the boat. The mast that carries it is called the "foremast." The main sail is carried by the mainmast, and if there is a third mast in the boat, between the mainmast and the stern, it is called the "mizzenmast." Every part of a boat, and every rope in its rigging has its special name, and the boats themselves have different names that tell you at once, when you know them, how many masts the boat carries, and whether they are cross rigged, or rigged fore and aft. A little boat with only one mast rigged fore and aft, is called a sloop. A boat like this one in the Source Picture is called a schooner. Schooners are always rigged fore and aft and have at least

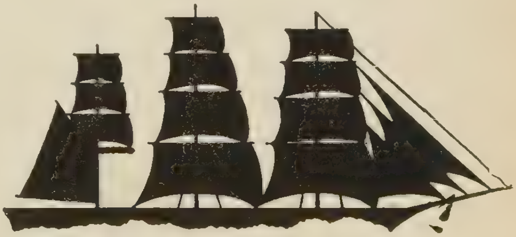


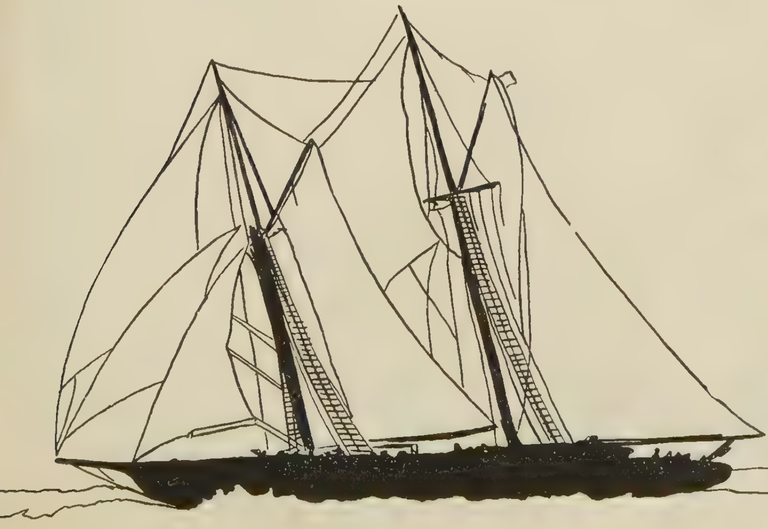


two masts. When they have more than two masts they are called three-masted, four-masted or five-masted schooners, as the case may be. Some big schooners are built with six and even with seven masts.

A cross rigged boat is often said to be "square rigged." The little girl who made the boat on Source Picture Number 5, rigged her sail across the mast and probably did not know that boats with only one mast are always rigged fore and aft. A two masted boat that is square or cross rigged is called a brig, and a three masted, square rigged boat is called "a ship" by the sailors, who laugh at the rest of us for not knowing all the different names that they use every day, and not using them in just the same way that they use them.

The old fashioned boats that first came to America, and those that made the famous first voyages around the world were all cross rigged. When you are drawing pictures, you often need to know about the rigging of boats. For instance, it would be a funny mistake to draw a picture of Columbus making his great discovery in a boat rigged fore and aft, and just as funny to draw a picture of the latest racing yacht cross rigged. Cross rigged boats do not sail as fast as those rigged fore and aft. They are steady and slow. A boat that is used just as a pleasure boat is called a yacht,





whether it is a sail boat or goes by steam or motor power.

Nearly all boys and girls love to draw steam ships and ocean liners. On page 79 there is a picture of an ocean liner that a boy cut from paper, and on page 77 you will see a picture of a tramp ship, that was cut from paper, too. A tramp ship is one that goes from one port to the next with any kind of a cargo she can get. As soon as she unloads her cargo at the port where she is, she takes on another, and goes wherever that cargo must be taken. So the captain and sailors on the tramp ship never know just where they may have to go next. Often they make long trips through lonely seas. The boy who made this picture of a tramp must have known that, for when you look at it you feel how very big the ocean is, and how far the tramp must be from home. And here is a picture of one of those old ships in which children traveled long ago, when they first came from Europe to America after Columbus had shown the way.

CHAPTER VII

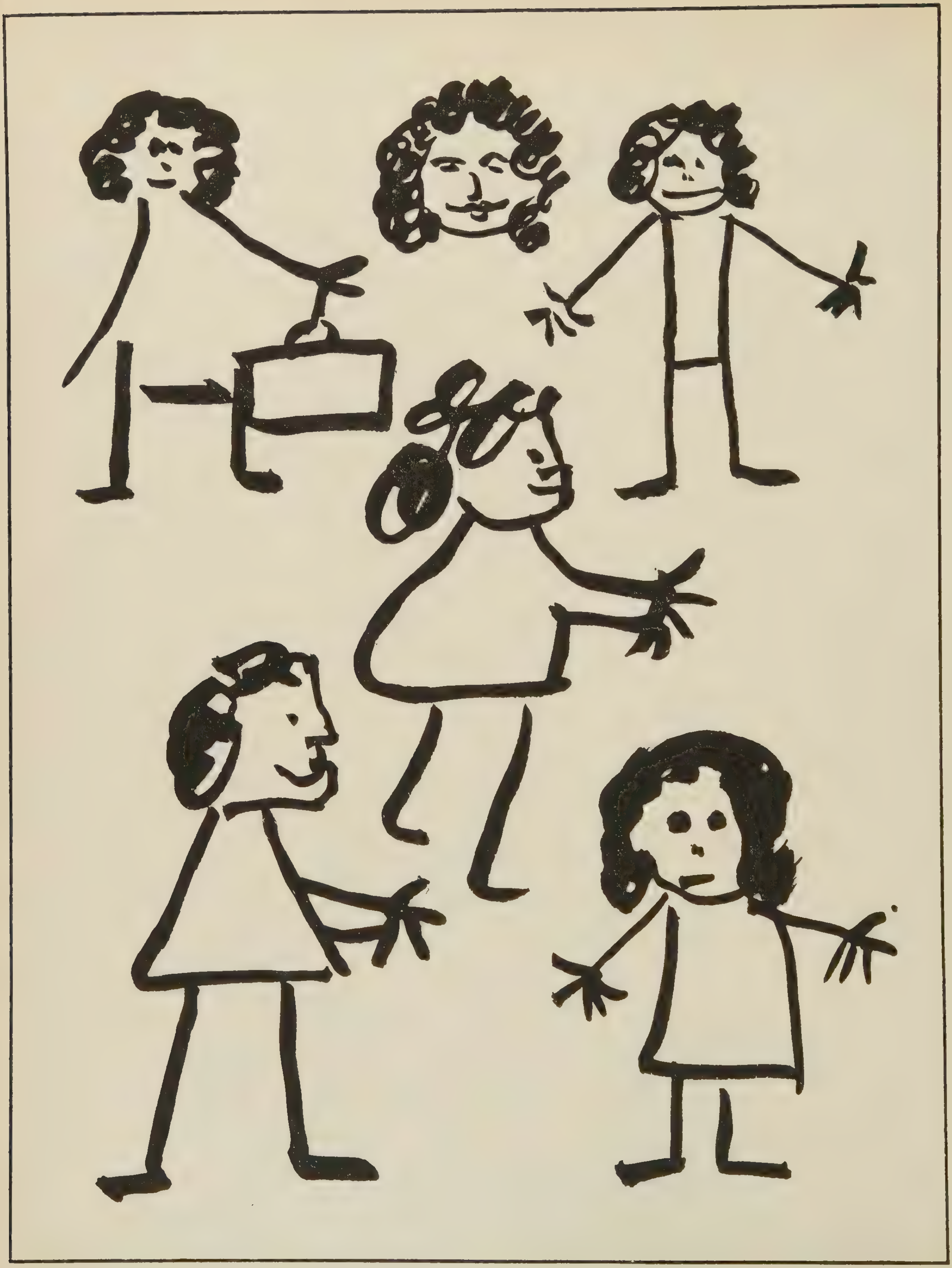
Story Book Children

CAN you tell the names of the different Story Book Children on Source Picture 7 of your scroll? And can you pick out each one—Peter Rabbit, Little Boy Blue, Red Riding Hood, Goldilocks, and the "Little Wee Bear"? As you see they are all hurrying along as if they had some special purpose in mind, and when you have heard the story about them, you will know just what that purpose is.

Once upon a time there were some children in a school, and they were going to give an entertainment. It was to be a "Book Week" entertainment for the school assembly. So they wrote a play and chose two of the girls and three of the boys to act in it. Each had to take the part of one of the story book children in the picture, and each one had to have a costume.

One little girl was to be Red Riding Hood, so she made herself a hood and a cape all of red. And she brought a little basket to school so she could carry the good things she was going to take to her grandmother.

And one of the boys was to be the "Little Wee Bear," so he made himself some white trousers and a red coat. And after that he made himself a bear's head out of paper, one that looked very much like a real bear when he put it on.



The little girl who had the part of Goldilocks had long golden hair that curled. So all she needed to do was to make herself a blue dress.

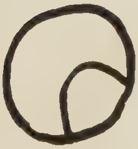
Little Boy Blue was a boy who had a blue suit, and so all he needed to do was to bring a toy horn from home.

But the littlest boy of all had to be Peter Rabbit, and he had a great deal to do, because he needed a pair of red trousers, and a blue coat, and a white rabbit's head with long ears sticking up, and a little round white tail. So some of the other children helped him, and they made all these things out of crepe paper.

Now when the costumes were finished, the actors tried them on for the rest of the class to see, and everyone was satisfied because they fitted very well and looked very real. Then one of the children suggested that the entertainment would be even better, if they could draw some pictures that would show the different scenes in the stories. So they set out to do that. But they soon found they could not make their pictures look real enough, and they were afraid the children from the other classes might not be able to understand them when they came to the assembly, and might even laugh at them perhaps. For you see when they came to make pictures of people, most of them looked very much like the ones on the opposite page.

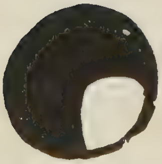
I dare say you have drawn pictures of the same kind. Nearly all children do, and when you are very little, or when you are drawing just for fun, such pictures answer well enough. But of course it is different when you are trying to draw something to put up in the assembly for your whole school to see and be interested in.

So these children talked together about what they could do to improve their pictures of people, and they decided to ask their drawing teacher to help them. Now the Story Book Children on the Source Picture of your scroll are the ones their teacher showed them how to draw. When you know that, you can tell the reason why they seem to be hurrying along so fast, and in such a determined way. It is because they want to help the children before the day comes for the school assembly.

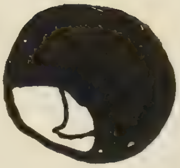


And now perhaps you would like to know just how the teacher told them to draw these pictures, and some of the important things she said. First she showed them how they could draw each figure in "steps" and how they could finish each step as they went along, before beginning the next one. Each time they began with the head. That was the first step. Here you will see the way they drew Red Riding Hood's head. First they drew a circle. Then they marked off the hood, and took their red crayon and colored it. As you see they had just a little bit of the circle left for the part of Red Riding Hood's face that would show underneath her hood. Their teacher told them it would not be necessary to make the lines for her nose and eyes and mouth.

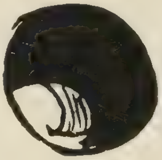
"When you are walking along the street," she said, "you meet people and notice the color of their clothes

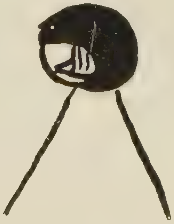


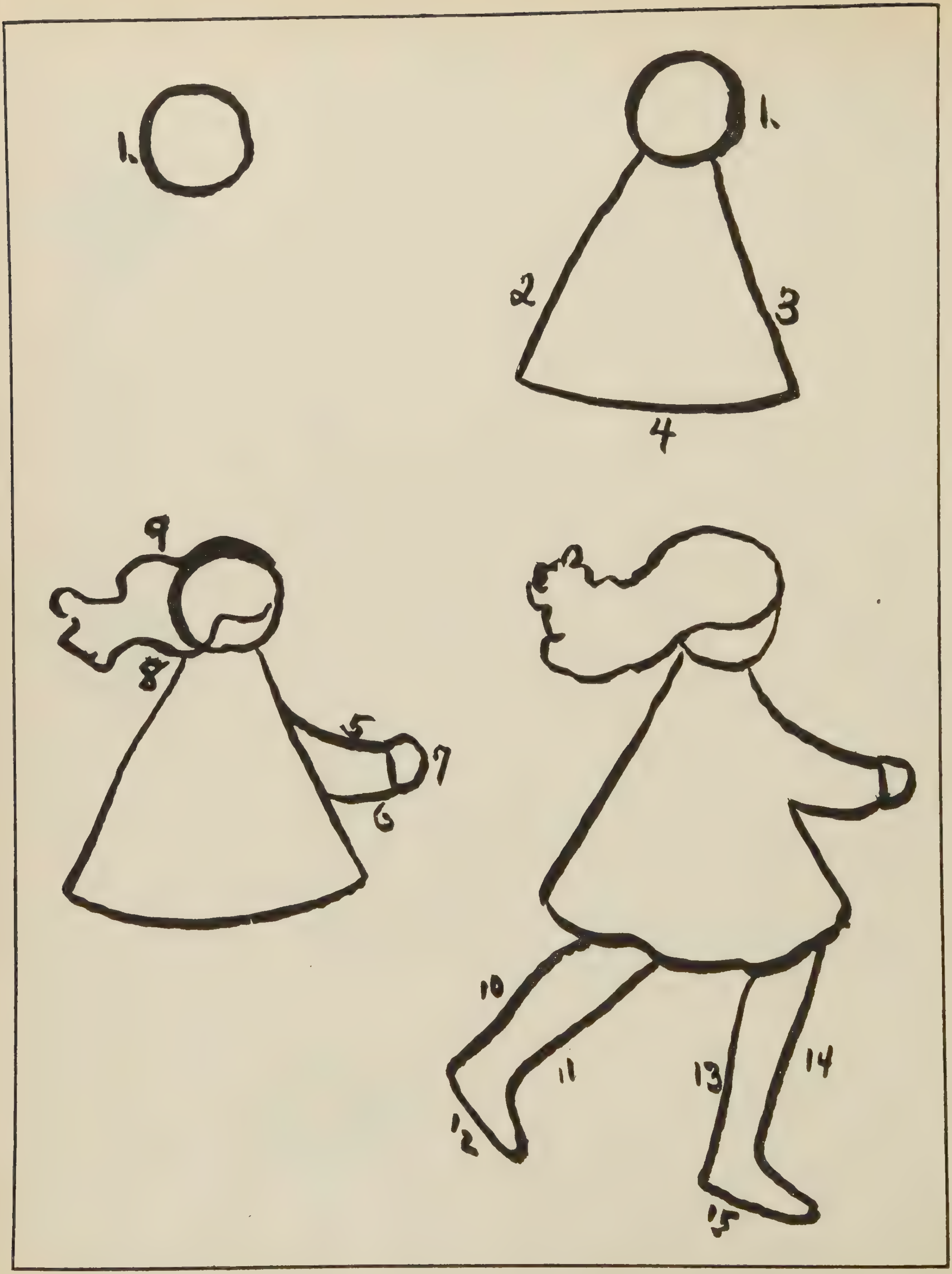
and the length of their skirts, or of their trousers, whether they are short or long, and perhaps you notice the color of their hair, but you do not see the color of their eyes. You know whether they are colored people or white people, but you do not see their noses or their eyelashes. And so when you are making a picture, it is not necessary to show all the details. A photographer shows all the details, but an artist knows that in order to make a work of art he must choose the things that are most important and leave out everything else."



So that was why they drew the red hood first, because they knew it was the most important part and the thing by which anyone would recognize Red Riding Hood. Next they drew the little lock of hair that just shows underneath the hood. That they colored with a black crayon and they left the white paper showing for her face. But when you come to draw on your green drawing board, you will need to fill in the part of her face that shows with a white crayon, and perhaps you can put a little touch of red in to make her cheek rosy. You will find it a good plan, too, to make all the first outlines in white crayon, whatever color you may use afterwards. When Red Riding Hood's head is finished, you will have come to the end of the first "step", and can go on to the next one and make the lines of her cape. After that is drawn and colored, you can add her arm and hand, and her legs, and feet, and her basket, one after the other.



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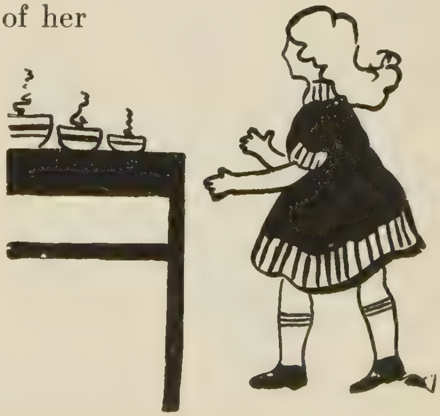
When you draw Goldilocks it is important to make her hair long, and it is necessary, too, if you want to illustrate the story, to know how to draw her so she seems to be running. On page 88 you will see the different "steps" that the children used when they drew Goldilocks. They waited until they had drawn her dress and arm before they drew her hair, because in that way they could tell better just how long to make it. The numbers show you how they drew the lines, first 1, then 2, then 3, and so on. First they drew the round head, then the two lines for the back and front of the dress, then the line across the bottom for the edge of the skirt. Then they made the dress blue all over. Next they drew the arm, first the top line of the sleeve, then the bottom line, and that they made blue, and then they made her hand. When they made the hand they drew it just as you see, in a little round ball, and did not try to show her fingers. But they took great pains to make the arm long enough, for their teacher told them that was one of the things children generally make mistakes about. And they could see by looking at their old drawings that in nearly all of them the arms were much too short. So they looked at each other's arms, and tried stretching out their own, to find out just how far they could reach down with their finger tips when they were standing perfectly straight. And then they drew Goldilocks' arm the way you see it in the picture. After they had drawn the two lines numbered 8 and 9, to make her long hair, they rubbed out that part of the circle that made the back of her



head and filled in the hair with yellow. Then they went over the yellow with a red crayon to make it golden. And they made her face rosy by using both their red and white crayons, with a little more red right in the cheek.

Each leg was made with two lines, first the back of the leg, then the front line with the front of the foot, and then the sole of the foot. And their teacher said to be sure and make the feet large enough, because when they draw feet children nearly always draw them too small. After they had drawn the outlines of Goldilocks' feet and legs, they put in lines to show the tops of her shoes and the tops of her socks. Then they colored her shoes, and her socks and her legs, as you see them in the Source Picture.

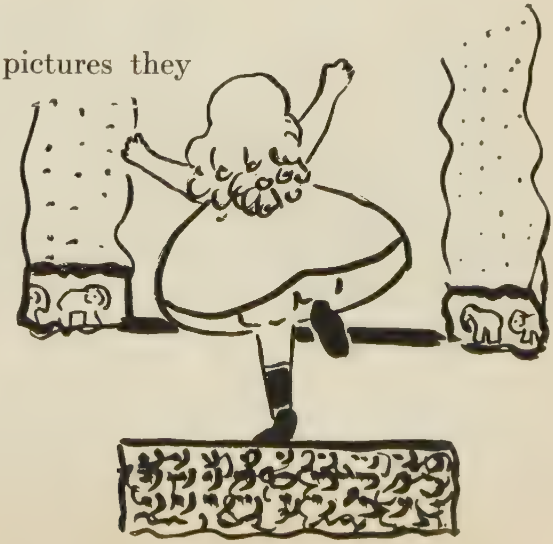
So in this way they learned to draw all these different Story-Book Children. Peter Rabbit and the Little Wee Bear had their heads drawn first like all the rest, then their jackets with the sleeves and hands, and then their trousers, first the back line, then the front line, then the bottom of each leg. Then their feet were drawn. Last of all the extra things were put in, the basket on Red Riding Hood's arm, Little Boy Blue's trumpet, Peter Rabbit's tail, and the trimming on the trousers of the Little Wee Bear. Some of the girls put trimming on the bottom of Goldilocks' dress, and one of them put a chain of beads around her neck. Each time the children finished up the part that they were drawing, the head, or the jacket, or the trousers, and put in the

color before they went on to the next part, and that made it interesting as they went along.

Then after they had drawn them all going one way, the way you see them in the Source Picture, they tried turning them around and making them all go the other way. For an artist, you know, needs to be able to draw people in all sorts of different positions. That was why, sometimes, the children drew them all running as fast as they could, faster even than Goldilocks seems to be running, and that, as you see, is pretty fast. Then, too, they practised drawing each one very large, because they knew the pictures for the school assembly would need to be large if all the other children were to be able to see them.

And after they had tried drawing them in all these different ways, they tried putting them in pictures that told about the different happenings in the stories. They drew Goldilocks looking around in the house of the three bears, and they drew her tasting the porridge. They drew the three bears taking their walk. The father bear was drawn in just the same way that they had drawn the little wee bear, only much larger and with a tall hat on his head. The mother bear wore a dress and a hat with a feather. And they invented different kinds of suits for the little wee bear. And one child drew a picture of them finding Goldilocks asleep in the bed. And another one showed her jumping out of the window.

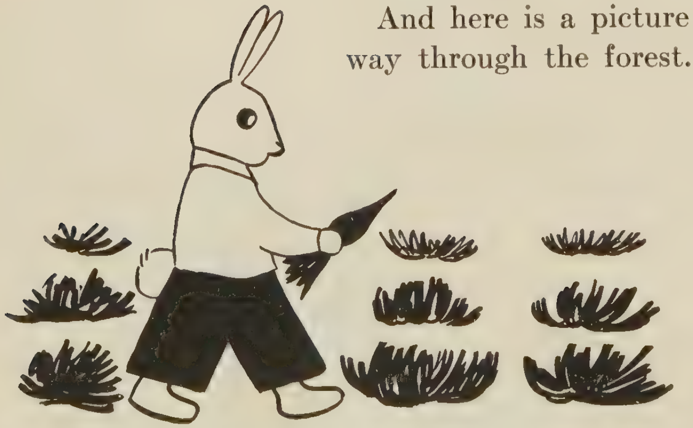
And while they were drawing these pictures they



found out some very important things. For they found that to make a good picture for the school assembly, one that would show at a distance, and be easy for people in the audience to understand, they must use big pieces of paper, and think always of the most important thing and make that large and bright in color, or outline it in heavy black so it would show plainly. The less important things could be put in afterwards to help with the story, but these they found could be made smaller or fainter in color, so as not to attract too much attention, and many of them could be left out entirely.

Here, for example, is a picture one of them drew of Peter Rabbit walking in the cabbage patch. He is the important part of the picture, and you can see how plain the heavy lines make his figure. He is carrying a carrot that he has pulled in another part of the garden. Back of him are the rows and rows of cabbages, but they were not drawn to look important. You can see they were just put in to make a little background and show that he is in the cabbage patch. You will notice that the near-by cabbages are made larger and darker, and the ones that are farther away smaller and lighter, until at last there is just a faint outline of a cabbage in the distance.

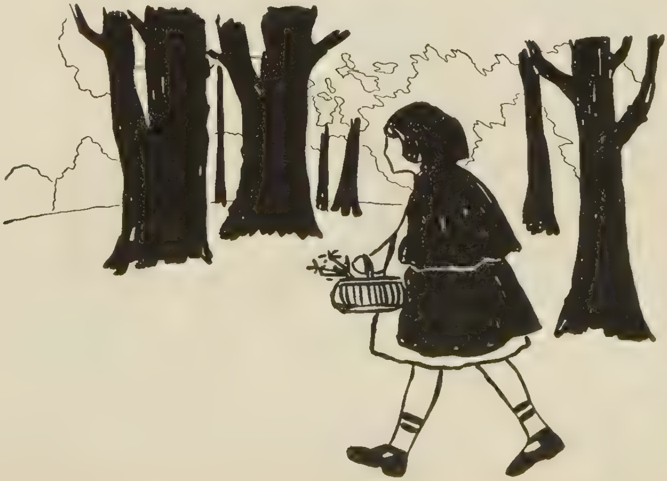
And here is a picture of Red Riding Hood on her way through the forest. You will see it is drawn in

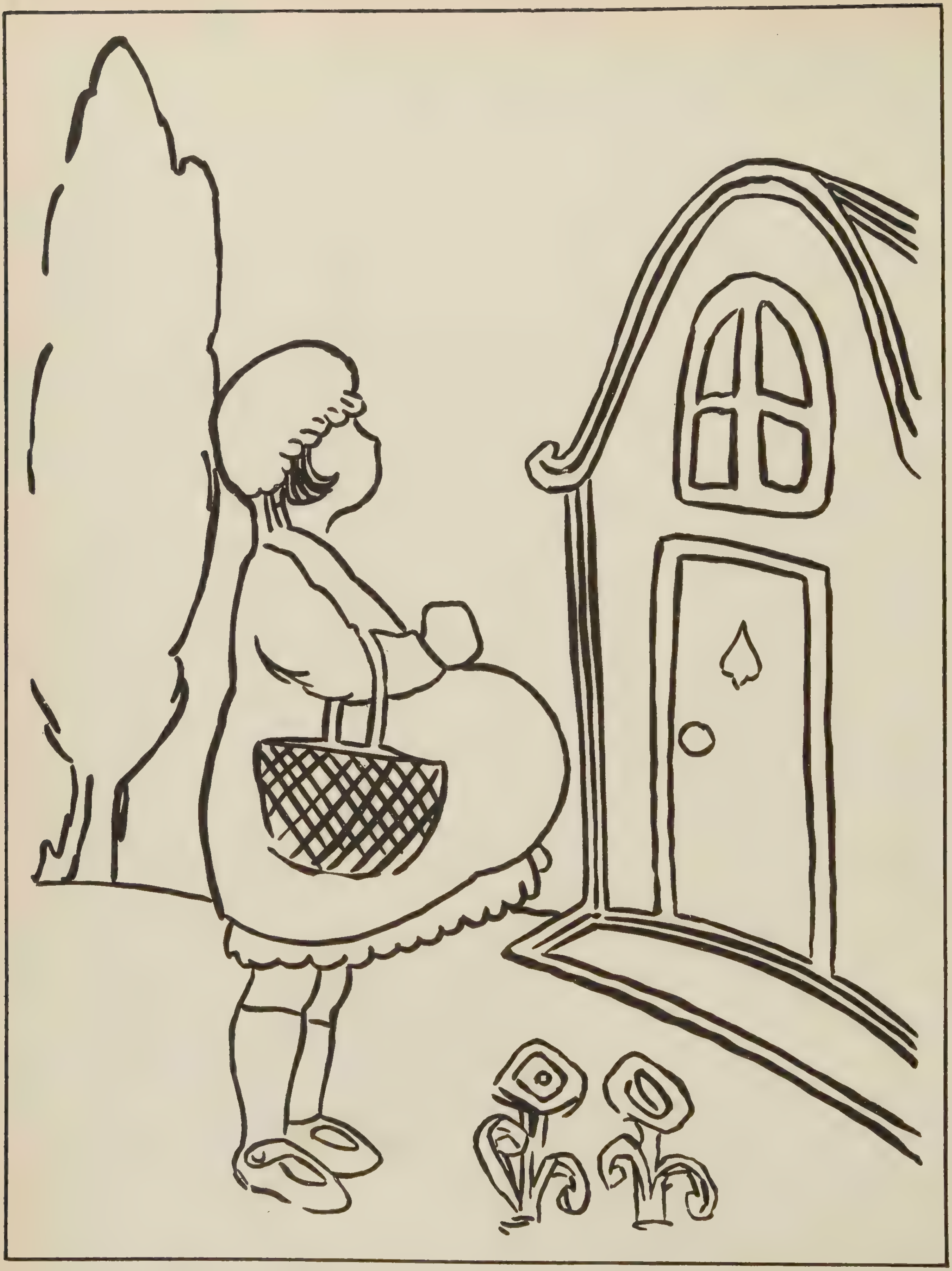


the same way. The little girl who drew it made Red Riding Hood the important thing and drew her very carefully, with a yellow dress showing underneath her red cape and some flowers in her basket. For, you remember, she stopped to gather flowers. But only the trunk of each tree shows, just to let you know Red Riding Hood is in the forest. If all of the tree had been drawn it would have been necessary to make Red Riding Hood very much smaller, so small that the children in the school assembly could hardly have seen her, and then the trees would have seemed the important things to anyone who looked at the picture.

And on page 94 there is a picture some one else drew of Red Riding Hood in front of her grandmother's house. You can see how the wind is blowing her red cape and how she holds her basket on her arm. But only the door of the house is shown in the picture. And because the door of the house is only a little taller than Red Riding Hood, we can show it and still make her the most important part of the picture, and large enough to be seen clearly at a distance.

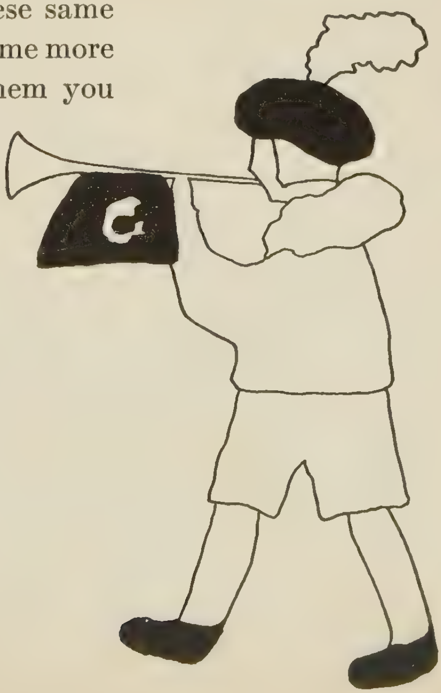
Well, when at last these children gave their Book Week entertainment, their pictures were very much admired by all the other classes in the school. And so they still went on drawing people in the way their teacher had shown them. Soon they found they could draw ever so many different kinds of people in this



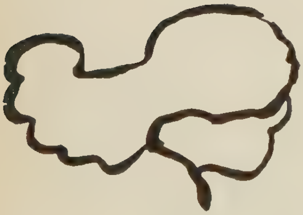


way. They drew little Alice and all the queer folk she met in Wonderland. They drew Dr. Doolittle and his sister and even some of his animals in the same way. And of course they drew Little Black Sambo and Robinson Crusoe, and, oh, ever so many others!

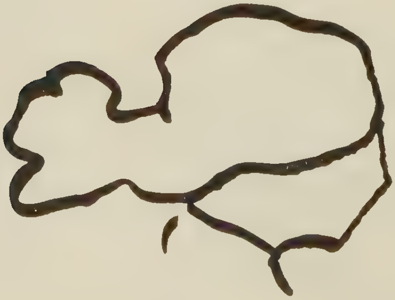
Here you will see the picture of a herald that their teacher drew for them. Heralds, as you know, were boys or young men who lived in story book times, and who used to carry messages for the kings and princes and great people of those old days. Sometimes they just blew a horn as a signal that the great people were coming and other people must get out of the way, and sometimes they blew their horns to make everybody listen, and then shouted a message in a loud voice. You will find it easy to pick out the steps that were used in making this herald. He is really very like Little Boy Blue and if you can draw one you can very easily draw the other. You will notice how much his face is like the face of Little Boy Blue and gives you a suggestion of the nose and mouth without really drawing them. The pictures of Red Riding Hood and Goldilocks, on the other hand, show only a side view of the forehead and cheek. In the chapter called "Poster Making" (Chapter XII) you will find some posters that were made by these same children, and in Chapter XXIII you will find some more of their pictures of people. If you look at them you will see how many of the faces have been made in one of these two ways.



And now let me tell you something about using the Hy-San colors on your drawing board. When you have drawn some of the Story Book Children and colored them with your crayons, you may feel a little disappointed to find the colors are not as clear and bright as you would like to have them. The dark board underneath dulls them a little, even though you are careful to spread the crayon on very evenly. The best thing to do then is to make some thick paint out of any broken pieces of crayon you may have, and with your paint brush paint over each "step" of your story book child, using the same color you used before. You will find this coat of paint will improve your picture very much. It is especially helpful, too, where you need to mix two colors together to get the right effect. Goldilocks' hair, for example, needs to have the yellow mixed with red to make it golden, and all the faces and hands will look more natural, if the white paint used for them is mixed with a tiny bit of something else to give it a flesh tint. Try mixing white paint with a very little red, then with a very little brown, and then with a very little orange (yellow and red mixed together) and see which makes the most natural looking flesh color.



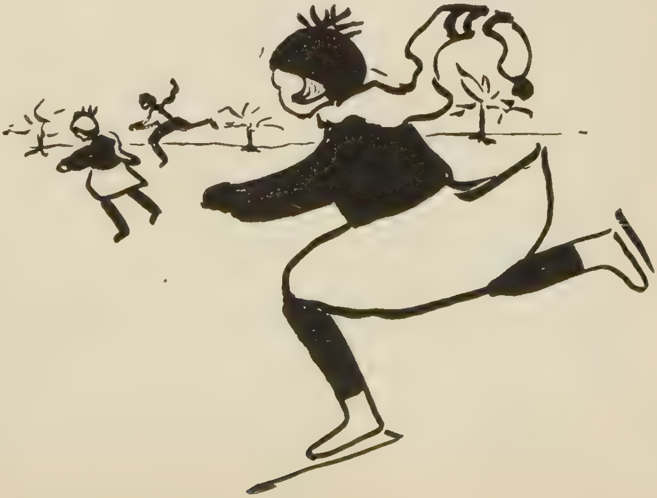
When you can draw the figures easily without thinking about the different "steps," try painting them all in thick white paint first. Look at the head of the Little Wee Bear in the Source Picture and you



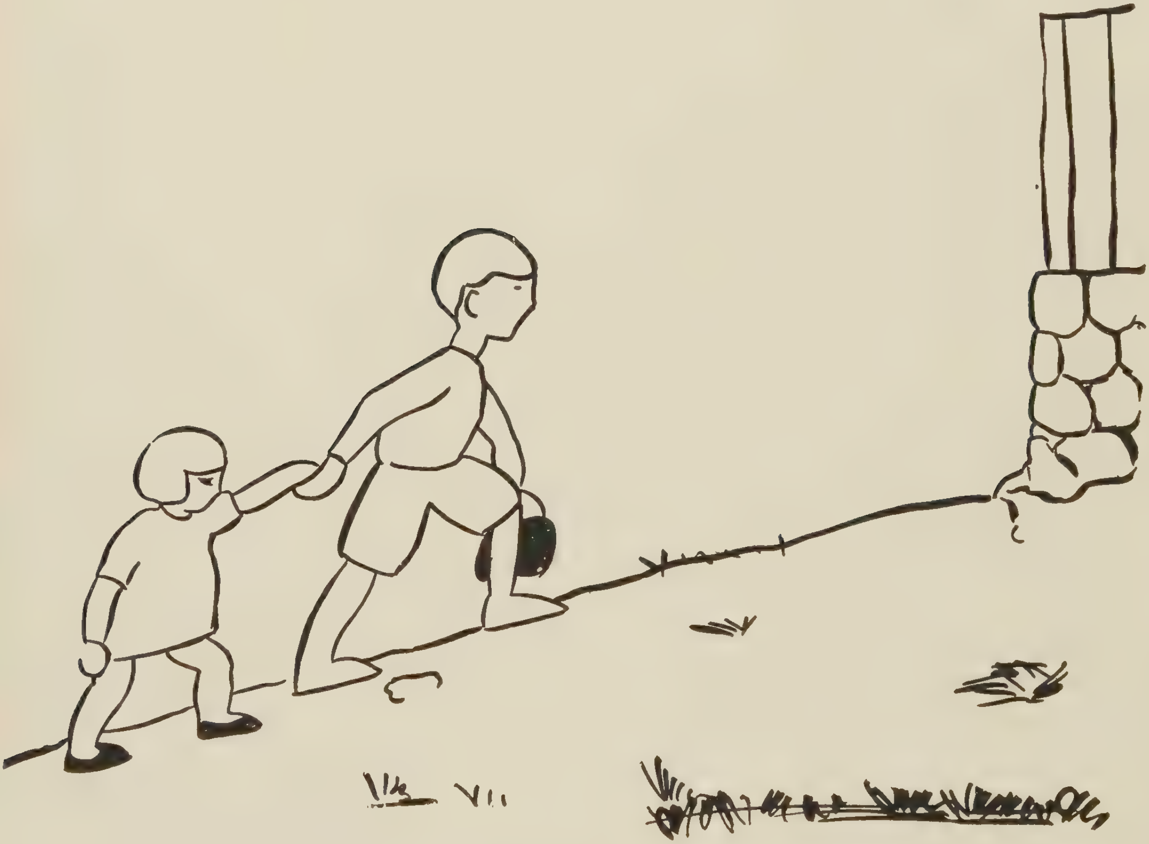
will see that he was painted all in white at first, and his head has been left white to show you how it was done. After the coat of white has dried, the right colors can be put over it in thick paint. That is the way artists paint on black paper. The thick first coat of white keeps the dark background from making the colors dull. But you will need to work quickly when you put on your second coat of paint, or the white coat underneath will soften and mix with the color, making it lighter and perhaps letting the dark background of your drawing board show through in places. After a little practice, however, you will find you are able to do it successfully.

And here is another thing you can do. Some day when you want to try something new, you will find these Story Book Children can all be "drawn with the scissors" and will look very attractive in cut paper.

When a real artist draws a figure from life, he generally finds that the figures he has drawn from statues and casts in the studio, help him to draw the real person. And in the same way, children who have practised drawing these story book people, have found that it was easier to draw pictures of real people afterwards. On this page you will see the figure of a little girl skating, that will remind you both of Goldilocks and of Red Riding Hood as you see them in the Source



Picture. And here is a picture of "Jack and Jill that" a grown-up person drew, just for fun. Can you pick out the "steps" she used? Try and see how many different people you can draw in this way, and how many different things you can make them do.



CHAPTER VIII

Story Book Land

When you come to draw pictures that will help to tell the stories of Goldilocks and Peter Rabbit and the other Story Book Children, you will find you need to be able to draw houses and trees, and sometimes you will need to draw castles. And it will be necessary, too, to be able to draw them in different ways so as to make them fit in with the story that you happen to be telling. Source Picture 8 of your scroll has three little scenes on it that are meant to help you when you do this kind of drawing.

The little house between the two pine trees looks so snug and homelike it might be the one where Red Riding Hood lived, and where her mother cooked so many good things to eat. Or perhaps Little Boy Blue lived there when he was not going out after the sheep and cows. He could not have slept under a haycock in the winter time you know. He must have had a house to live in when the meadow and the corn field were covered so deep with snow. The house on the other side has a mysterious look under those great trees. You can see it must be on the edge of a wood, and it seems very probable that it is the house where the three bears lived. As for the castle, perhaps that is the one where the Sleeping Beauty took her famous

nap, or the one where Cinderella and the Prince lived happily ever after.

Whichever it may be, you will find the castle is great fun to draw. It can be drawn in all the different ways you draw the Story Book Children, by just using your colored crayon, by putting a coat of paint over the crayon afterwards, or by painting it first in white, and then putting a coat of color over that. The last way is the hardest but gives the gayest effect.

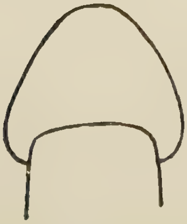
The castle can be drawn in "steps," too, as you will see by the pictures on this page. You begin with the two sides of a tower, and put a line across the top. Then you put the color in. Next you draw the roof and color that. Then a part of the castle wall can be added, then another tower. And so you can go on building your castle by adding towers and walls, and inventing new ways of putting them together to suit your own taste or the particular story you happen to be telling.

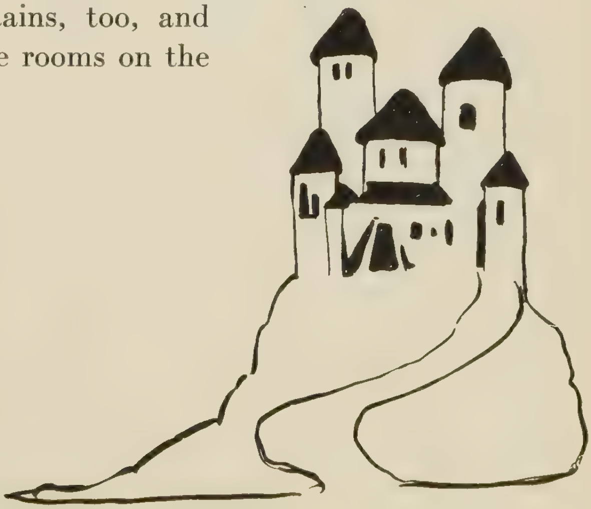
And that is not so very different from the way in which real castles used to be built in the old days. Their owners kept adding new towers and new walls as they happened to fancy. Sometimes they were just trying to make the castle larger, sometimes they were trying to make it stronger and easier to defend against its enemies. For a castle, you know, was a fortress as well as a place to live in. That was why it was generally built on a hill, or a steep, rocky place, and often had a deep ditch called a "moat" around it. Its owner

tried to make it just as hard as possible for an enemy to get into it. Outside the walls were very thick, with very few windows. Those that they had were made as narrow as possible, so as not to interfere with the strength of the walls. The towers were useful because from the tops of them you could look off and see things in the distance. In that way you could know whether an enemy was anywhere about. And if the castle happened to be attacked, the towers made high places where the men who defended it could stand. Then they could shoot down on the heads of the enemy below.

The little picture on this page shows a castle on the top of a steep hill with a road winding up to its gate. It is just a story book picture, drawn for the fun of it, but it shows you a different way of arranging your towers and walls, and you will find you can invent other ways. I imagine the people who live in castles today—and in old countries some people still do—are more interested in having good roads like that leading up to their castles, than they are in making them hard to get into. For today people do not have to worry about defending themselves from enemies who make private wars on them. But such things used to happen in the old times the story books tell about.

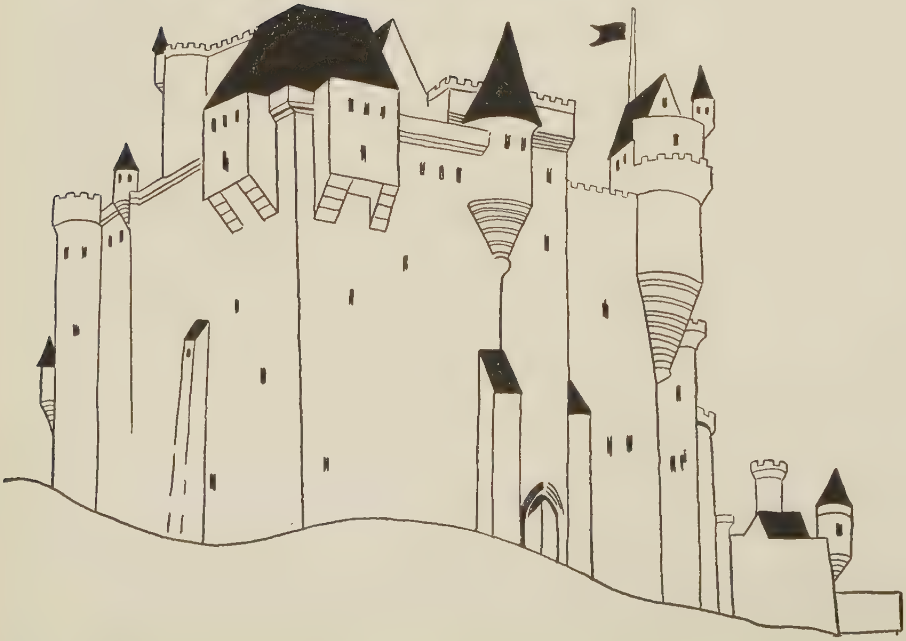
Inside the walls the castle was sometimes very beautiful, with court yards that were planted with flowers and trees. Sometimes they had fountains, too, and sometimes big windows were put in the rooms on the





court yard side, for it was safe to have them there. But whatever else they might have, there was one thing every castle *had* to have. That was a well. Not even the strongest walls or the most beautiful towers or the most splendid rooms were as important to the people who lived in the old castles as their well of pure water. That may seem funny to you if you have never thought of it before, but you can easily see that it must have been so, and the reason why.

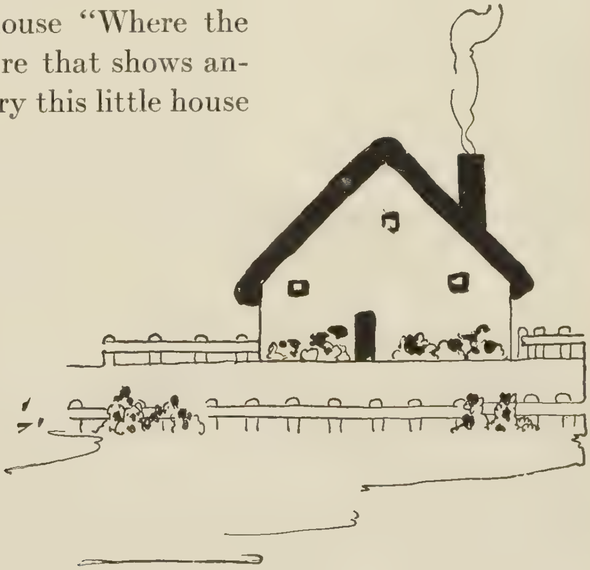
Here is a picture that a big boy made to show his idea of a castle. He made it out of cut paper. The stone walls were of gray paper, and the roofs of red. He pasted it on a blue background that looked like the sky, and he made the ground around it of green paper shaped like the top of a hill. Very few real castles were ever as big and strong as this one. But the picture gives us a good idea of what people had in mind when they built castles. They would have liked to make them even bigger and stronger than this if they could have done so. Do you see how the tops of some of the towers and walls are shaped—up and down, like the top of a king's crown? Those are what we call "battle-

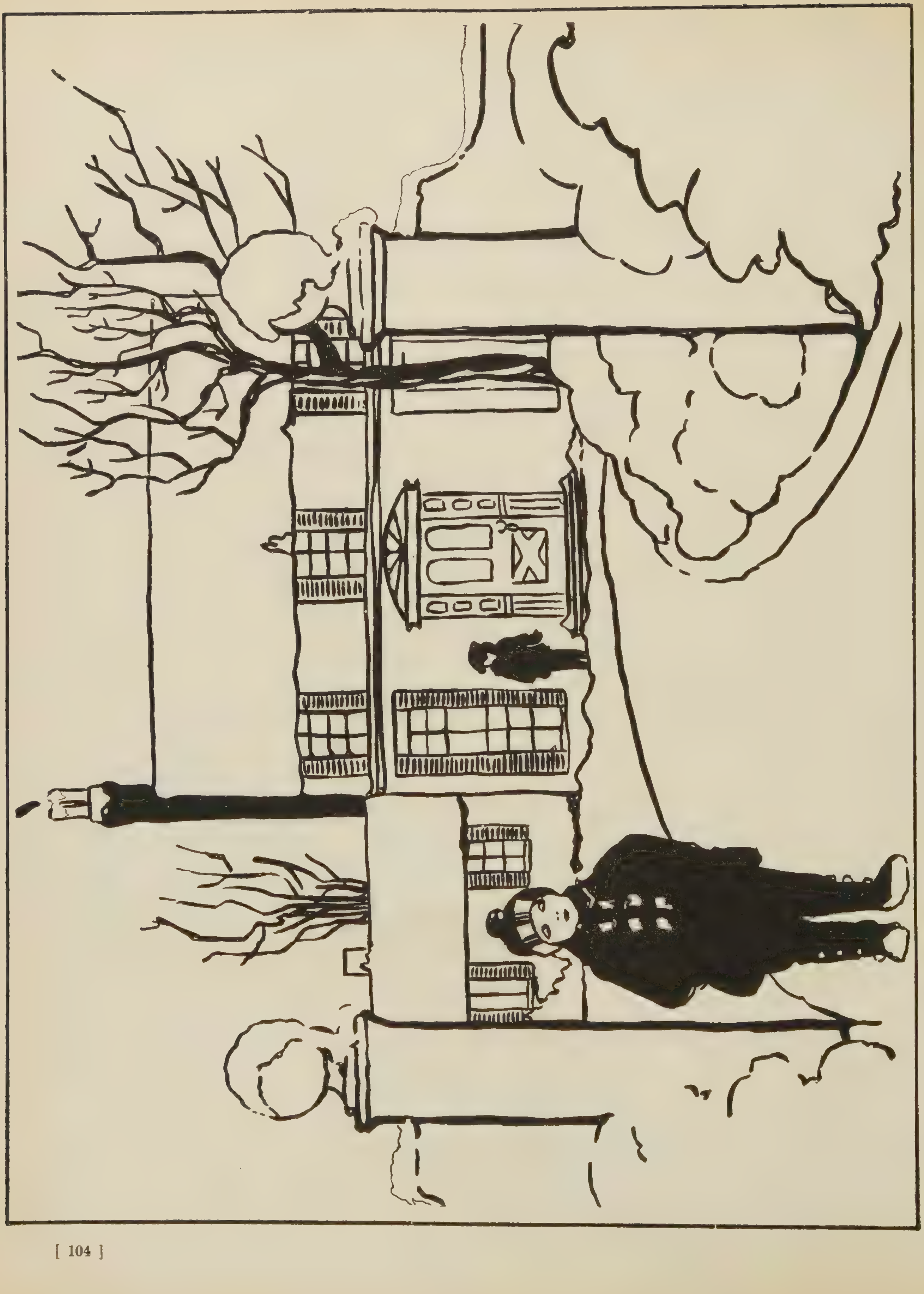


ments" and were meant to protect the defenders of the castle when they were shooting down from the tops of the walls. You can draw your castles with battlements if you like. Or you can shape the roofs of the towers in the eastern fashion with a pointed dome like the one you see on the margin of page 101. Then your castle will fit nicely into scenes from the stories of the Arabian Nights. Try leaving out the snow and making the walls brown or gray instead of red, as they are in the Source Picture. You might put in a blue sky back of the towers, too.

But not all the people of Story Book Land lived in castles. Some of the most interesting ones lived in houses, and some in very tiny houses at that. The easiest way to draw a house is to show only one side of it. If you do that well, your house will look real enough to help tell any story you may have in mind.

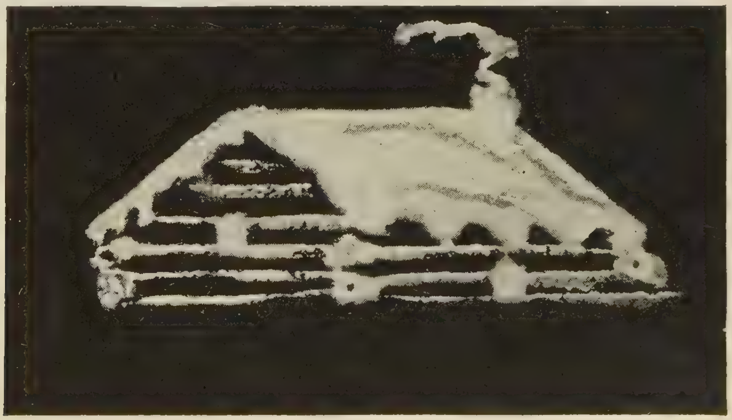
On the first Source Picture of your scroll you will find a house that shows only one side and is very easy to draw. You will remember that was the way "John" used to draw his pictures of the house "Where the children live." And here is a picture that shows another way in which it can be done. Try this little house

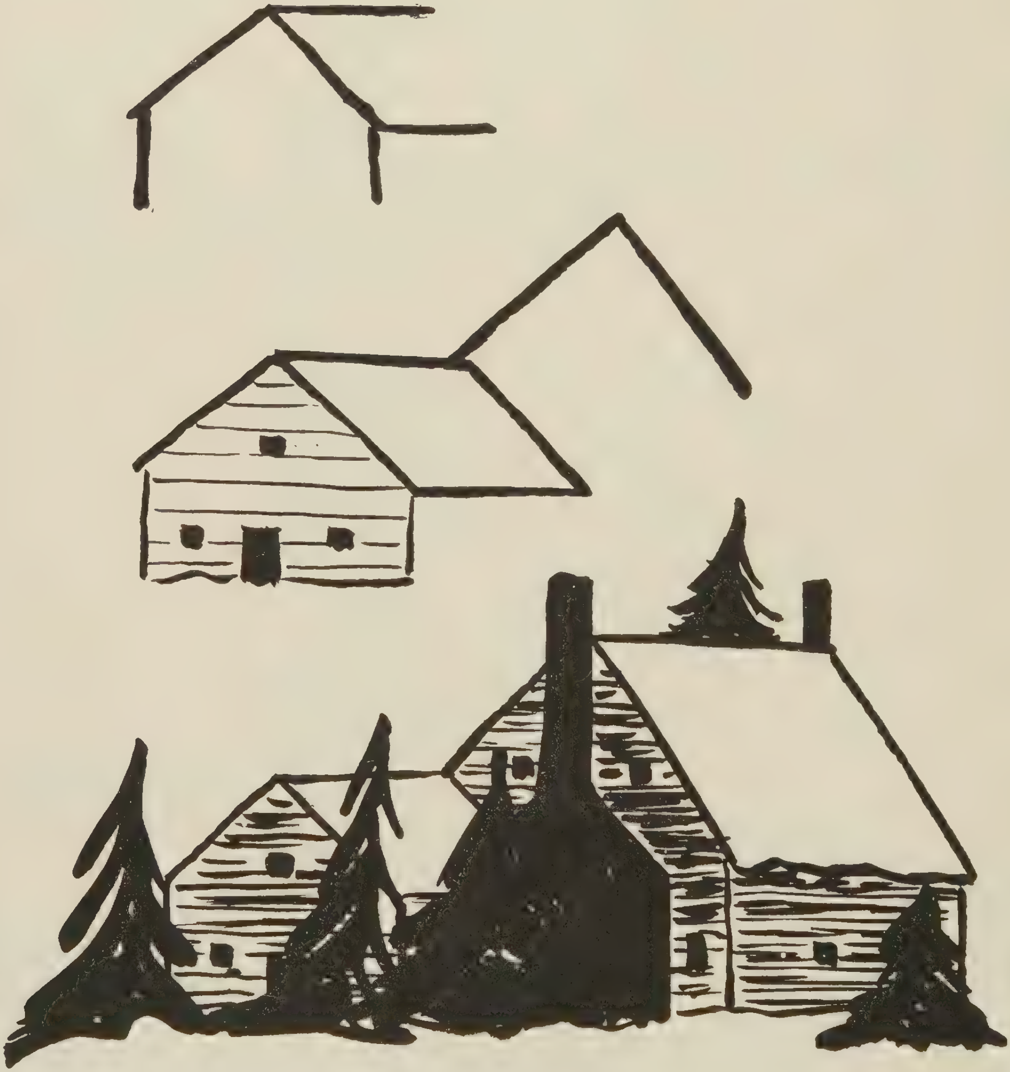




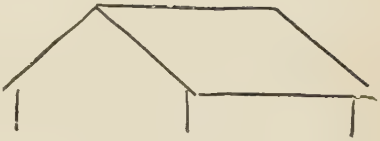
in colors on your drawing board. Make it white with a red roof and chimney, and "green grass growing all around" as the song says. Make the sky blue and have some white smoke coming out of the chimney. Then put a white fence all around it and some flowers growing in front. You can use brown or black for the door and windows. When it is done, you will agree it looks as if it were the very house that little Haensel and Gretel used to live in, before they wandered off into the woods that day, and found the gingerbread house and the dreadful witch, who kept them prisoners for so long. I think it would improve the picture if you could put in one or two nice trees with their brown trunks standing near the house, or perhaps, with their green branches just showing behind the roof and sides. Trees always make a house seem pleasanter and more homelike. Even a castle is much improved if we can have trees growing near it.

On page 104 you will find another way of drawing a house and showing only one side of it. A grown-up person drew this one. She wanted to show her idea of the house "Where the children live." As you see, she put the children in the picture so there should be no mistake about it. And she certainly gave them a nice house to live in. You will find it interesting to draw one like it, and to choose the colors you think would look best and paint it afterwards.

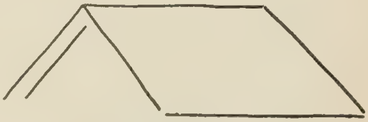




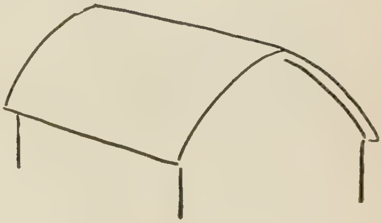
Sooner or later you will want to draw your houses so as to show two sides. This may seem hard at first but you can soon learn how to do it. Begin by making a "one step" house like the little houses on either side of the castle in your Source Picture. Or try this little log cabin. You will surely need to draw one like it for some of the Story Book Children who lived in America long ago. When you are drawing a house that shows two sides the important thing is the roof. If you can make the lines for the roof in the right way, the rest is simple.



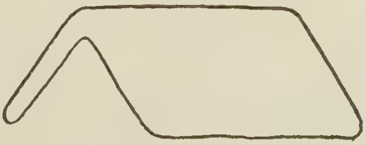
Try drawing and painting the little houses on the Source Picture in all the different ways you can think of. Draw them as they would look in summer with blue sky back of them and green grass below. Make their roofs brown, or red, or green, and put different kinds of trees near them. Remember, too, you can make them in cut paper.



Here is a house that a little girl modeled in clay. As you see, she remembered the door and windows and the chimney. But she might have done more. She might have put on the colors and made her house look more real than it can possibly look in the gray clay. Try making some clay houses, and then try a castle. You can make wonderful castles in clay, and show just how they were built around their court yards and where the towers and walls were put.

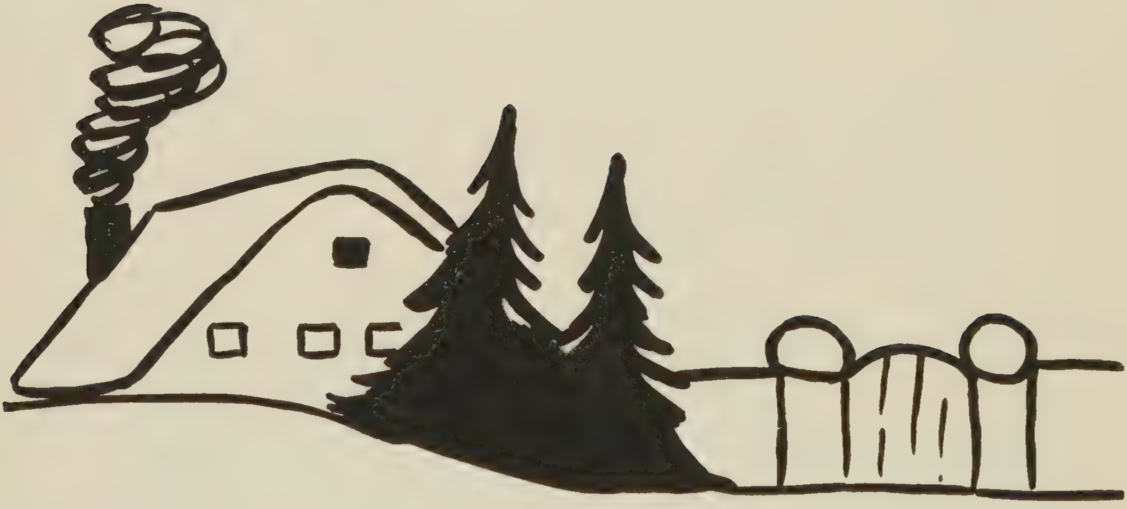


On the opposite page you will see a house drawn in two "steps," and you will find you can draw it quite easily if you know how to make the roof lines of a "one



step" house. In the old days many American children lived in houses like this one, with a big chimney at the side and a little wing that had just one or two rooms in it.

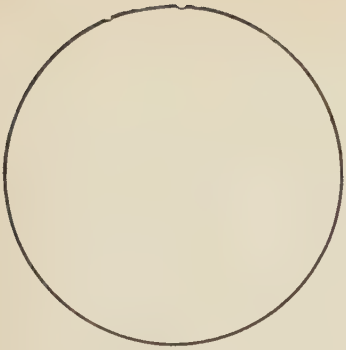
Some of the old houses had more than one wing, and that is true of many newer ones where story book children will be found living to this very day. These bigger houses can be drawn in three "steps." But like the "two step" house you will find they are not hard when you have really learned to make the roofs of the "one step" houses.

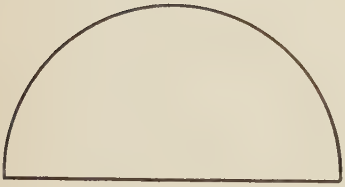


CHAPTER IX

In the Children's Garden

DID you ever see real flowers that looked like the ones on Source Picture Number 9? No, I do not think you ever did. It would be hard to give any one of them a name, unless, perhaps, that little yellow one, underneath the butterfly with the red stripes on his wings. That one might be called a primrose, yet after all, it is not very much like a real primrose. It just makes you think of a primrose, and that is true of all the rest of them. They do not look like real flowers. They only remind us of flowers. But when we see them there, standing up so straight on their stems, with all their green leaves, they do very well as a picture of the children's garden. For you see, they make us think of what it is the children want in their garden. They want lots of flowers in all sorts of bright colors, and they want butterflies and bees and birds flying about and enjoying the garden with them. When we look at this picture it reminds us of all those things. So we enjoy it almost if not quite as much as if the flowers and the butterflies were painted to look real. You will see flower pictures of

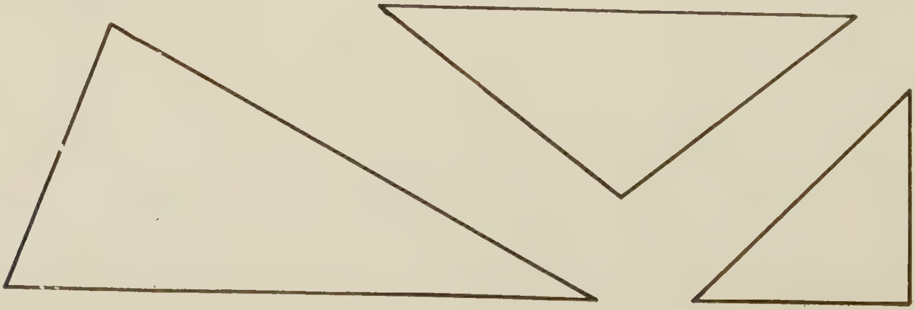




this kind on a great many things and in a great many places where people wish to use gay colors. Wall papers, for example, sometimes have such flowers. The colored chintzes and silks that are used for curtains and furnishings in our houses also have them, pictures that remind us of the flowers, instead of showing us exactly how they look.

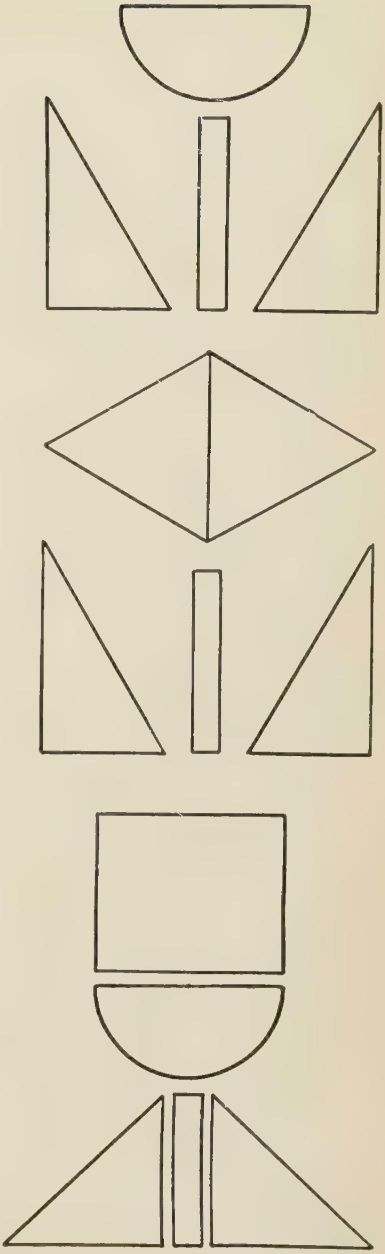
A little boy was once painting a picture and he used the most lovely colors. He had his paper covered with them, and he took pains that the colors that came next to each other should be the very colors that look most beautiful when you put them side by side. A grown-up person looked over his shoulder and asked him what he was painting. "Not anything," he said. "This is just to look pretty." Did you ever do that? Put lovely colors together, and enjoy them just because they look pretty, and not because they look like any special thing? We often see colors put together like that in cloth and silk, and in glass and pottery and other materials. Sometimes at sunset it seems as if the sky had been painted in very much the same way, "just to look pretty."

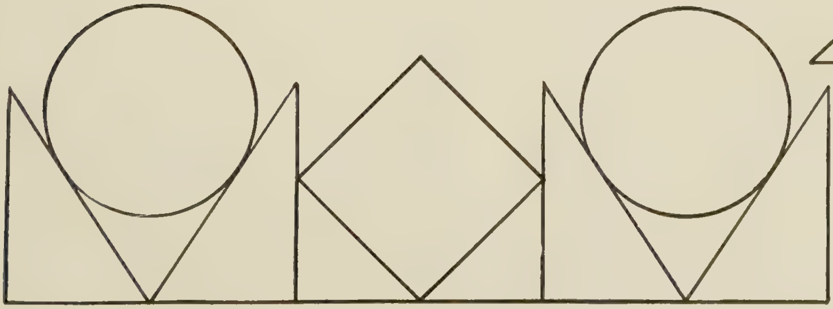
People who enjoy putting colors together, often make patterns out of special shapes of different colors. Some boys and girls have games to help them do this—"parquetry games" they are called. They come

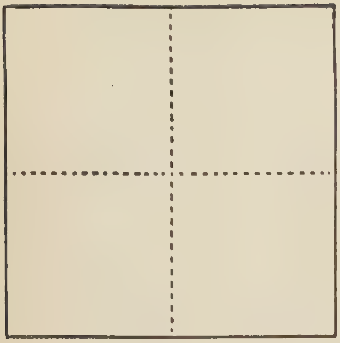


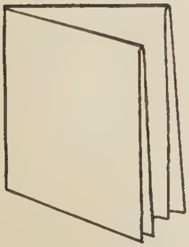
in boxes and are made up of pieces of wood or cardboard in all sorts of shapes and colors. You can make such a game for yourself by drawing the shapes on cardboard and then cutting them out and coloring them. On page 110 you will see pictures of the shapes most often used for such a game—the square, the oblong, the triangle, the circle, and the half-circle. Each one has its own name, and they are useful names to know. People use them in all sorts of ways. Indeed, nearly everywhere you look, you can see at least one or two of them being used in some way. The tops of the blocks in the block set on page 62 are shaped like some of them.

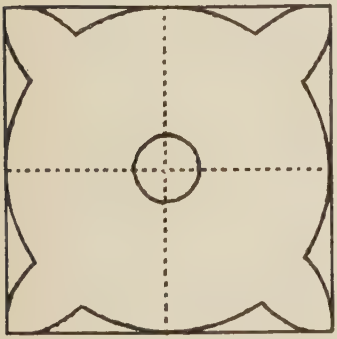
In the parquetry game the shapes can be used in two ways. They can be put together so that they make a pattern that has no special meaning, or they can be put together so that they remind us of something. Look at the pictures on this page and you will see what I mean. You can easily pick out the ones that just make a pattern, and the ones that remind you of something, and you can make some yourself of each kind. But the shapes that are put together to remind us of something make a pattern as well as the others. They do both things at once. They remind us of a flower and at the same time they make a pattern.





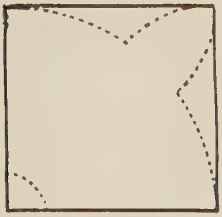


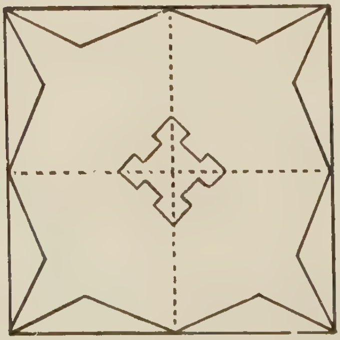


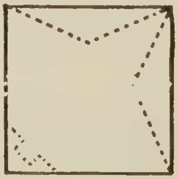


This is true, too, of the flowers in the Source Picture of the children's garden. Notice how carefully they are arranged. The one in the middle, and the two on each side of it, make a little group of three, and at each end there is a tall flower standing by itself. Even the butterflies are placed in such a way that they form part of the pattern. Indeed, if you were to draw this whole picture in white chalk on your drawing board, or in black pencil on a sheet of paper, without using any color at all, you would find the outlines of the flowers and leaves all by themselves make a very lovely design,—one you would really enjoy looking at. To be lovely and attractive a design like this needs to be very carefully drawn. Both sides of the flowers need to be just the same size, and all the lines need to be even. The leaves especially, need to be just alike on each side of the stem because that kind of careful drawing adds greatly to the beauty of such pictures. For that reason, even though they look so simple, they are really hard to draw.

But I know what you are thinking, and it is true. These particular flowers and leaves were not drawn at all, at least not with a crayon or a pencil. They were cut from folded paper and that is the reason why they are so even, so exactly alike on both sides, and above and below the centers. The pictures on this page and the next show you just how you can

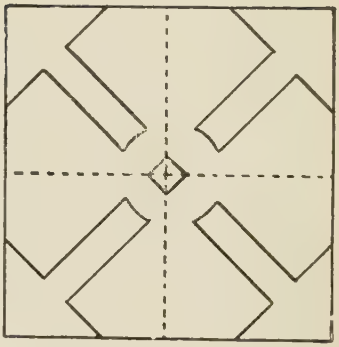


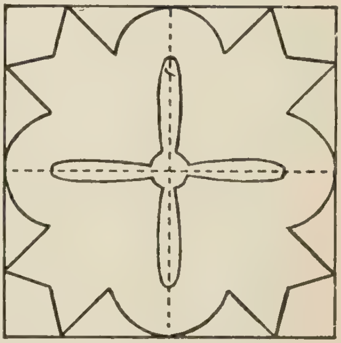


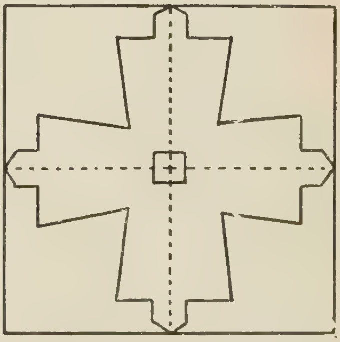


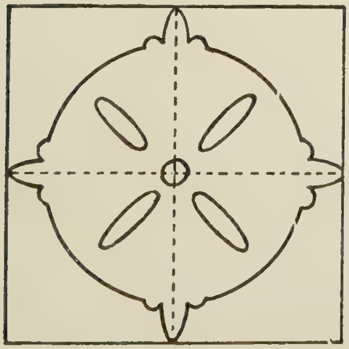
fold your paper and cut it to make these flowers and leaves. You will find them just the thing to put on a birthday card, or on a book cover, or on a paper box perhaps, when you make one. You will probably wish to use them in different ways, and not always just as they are arranged here. More than that, you will find that you can invent other shapes. You can get very pretty effects too, by pasting one shape over another of a different shape or a different color. If you look at the blue flower on the left of the middle one, you will see where this has been done. The middle flower itself is made of two pieces of paper, an orange shape pasted down over a light yellow one that is just a little larger, and so makes a light yellow edge all the way around.

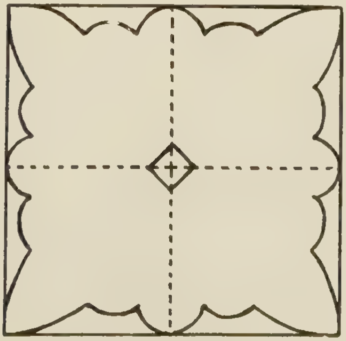
Now, while the separate flowers on this Source Picture remind us of real flowers, and may be used in various ways, all of them together make a picture that, as I said in the beginning, reminds us of the garden itself, and of what every one of us would like our own garden to be. In the first place, we would each like our garden to be as full of flowers as possible, and I am sure you will agree that it would be very hard to add another flower to this picture. It would have to be made small and really squeezed in, if we succeeded in doing it. Then, we all think of a garden where things are growing well, and where many







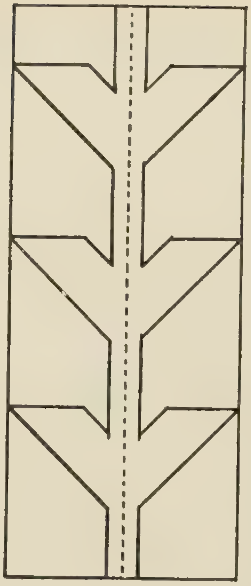




flowers are in bloom, as a happy and joyous place. The picture reminds us of that too,—perhaps because the colors are so gay, and because the butterflies seem to be having such a good time.

But why is it that a garden, especially a flower garden, seems so joyous and beautiful? When we go into one we feel very much as the butterflies do. And when we are little, the flowers as well as the butterflies, seem to us just to be having a good time. We think they are enjoying the sun, and the warm summer air, and their own beautiful colors and sweet scents, without really *doing* anything. When we get to be a little older we find out that this idea is entirely wrong. Very important work is being done in the garden, and by the very flowers that seem to be doing nothing at all, and having such a good time at it. I believe it is true that they are having a good time. For they are working every minute at work they love to do. In some ways their work is very like the work that children have to do. I mean they have to grow. That is the thing of first importance for children and flowers alike. And flowers grow in much the same way that children grow, by eating and drinking and breathing and sleeping.

A little girl once wrote a composition in school, and she choose for her subject, "When do flowers go to bed?" Did you ever ask yourself that question, and

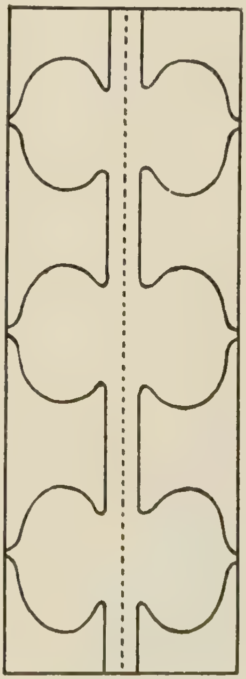


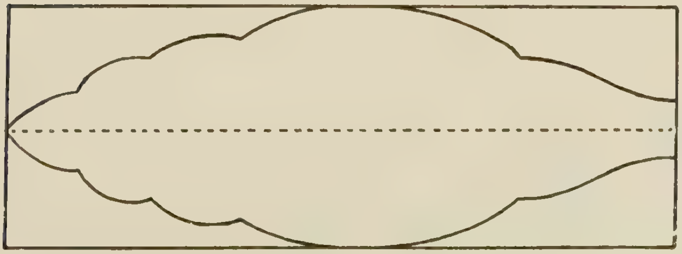
can you answer it? Perhaps like children, not all of them go to bed at the same time.

Do you know how a flower breathes? Has anyone ever told you? It breathes with its green leaves. That is one reason why the leaf is so important a part of any plant. When we are very little we seldom think much about the leaves, because the gay color of the flower attracts us so much more. But when we grow a little older, we begin to notice how many different and beautiful shapes the leaves have, and in how many different shades of green they come. You will find that artists use leaves in the patterns they make for decorating quite as often, if not oftener, than they use flowers.

Of course, you know how necessary it is for a plant to drink—how careful we are to water them, and how we need to give them more water when they are in flower than at any other time. When the roots of the plant drink up the water from the ground with their hundreds of tiny mouths, they drink in with it some of the food stuff that is mixed up with the ground. For the food of plants is in the ground where they grow.

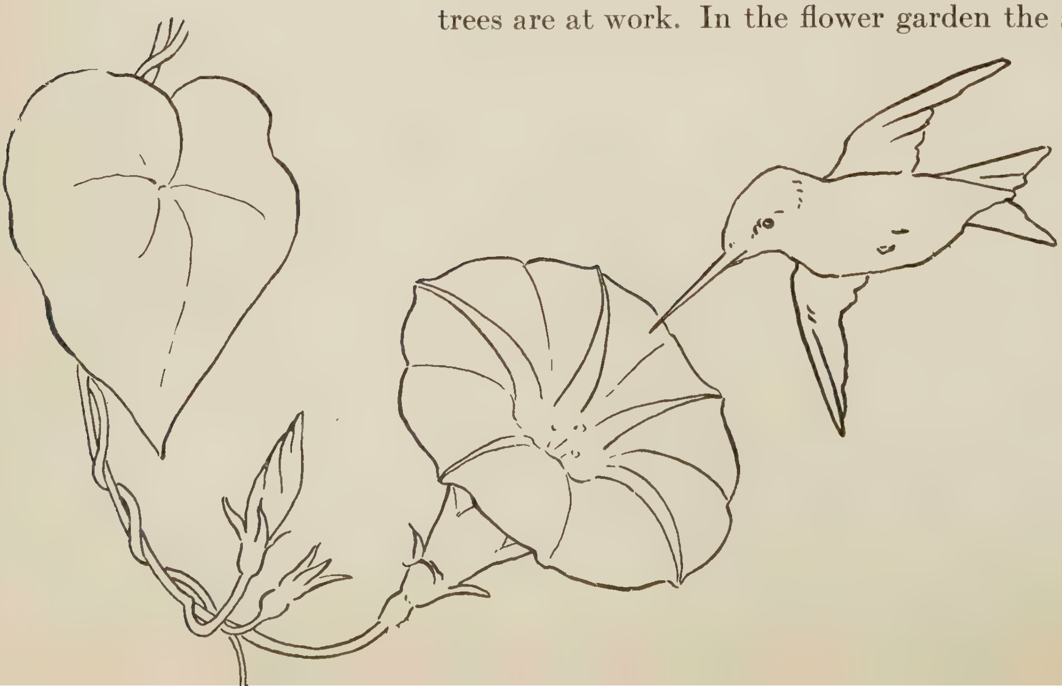
A wonderful thing about it is, that it is not really so different from some of the food we eat. Like us, the plants need growing food, and at least some engine food, and some food to keep them well. It is the same food as ours really, but it is in a different form. You





know how it is with some of the food we eat. When we first buy it at the market or at the grocery store, it seems entirely different from the food that is served at the table. Take flour for instance. Think how different that is from the bread and biscuits and other things that are made from it. Yet it is the same flour, the same food stuff, only it has been changed to a form in which we can eat it. This was done by someone in the kitchen, someone who knew just how to take the raw material and make the right changes in it, so it should be fit for us to eat. Very much the same kind of work is going on in the garden, but there it is the plants with their leaves and flowers that make the changes.

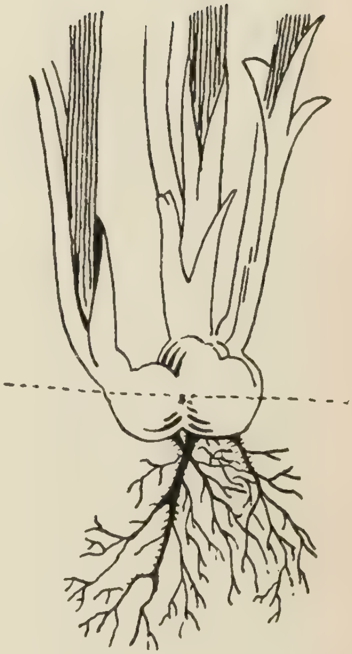
The food of the plant is drawn up through its stems. Then it is taken into the leaves that are spread out to breathe the air and catch the sunshine. And in some wonderful way that even grown-up people find it hard to understand, the sunshine and the air, and the green leaf all together, change that coarse food into a finer kind. Then other creatures and even human beings can enjoy it. The plants in the vegetable garden all make their coarse food into kinds that we find good to eat. The same is true in the wheat field and the corn field and in the orchard where the fruit trees are at work. In the flower garden the same kind

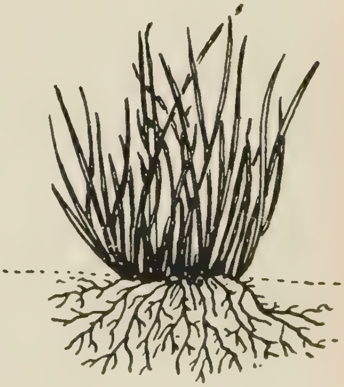


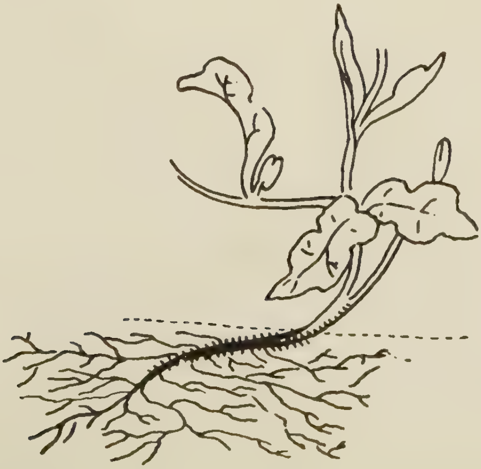
of work goes on, only there the food the plants are making is not of a kind that we can eat.

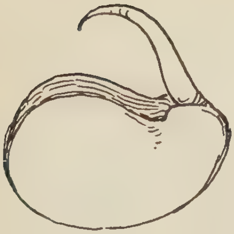
So we grow our flower gardens for the beauty and pleasure of the flowers, not because of the food they make. But, as you have surely guessed, the food of the flower garden is not wasted. No, indeed, for the butterflies and the bees and the birds, yes, and ever so many other creatures—insects and worms and caterpillars for instance, all have a good time there. Some of them gather honey from the heart of the flower cups. Some of them eat the green leaves, and some of them come for the seeds that the flowers are making. Some of them, too, the birds especially, make their dinners from the other live creatures who have come to feast on the plants. If this were not so the plants would often be eaten up entirely, before they could finish their season's work.

But do you suppose that in doing their work, the plants and the flowers are really so kind as to be thinking of the bees and the butterflies, the insects and the birds? Are they thinking even of the hungry children and the grown-ups who get their breakfasts, and their dinners, and their suppers from the food that they are making, day by day? Oh, no indeed! They have no such idea in mind. They have no ideas and no minds for that matter, although they sometimes seem to have. You will agree that some of them





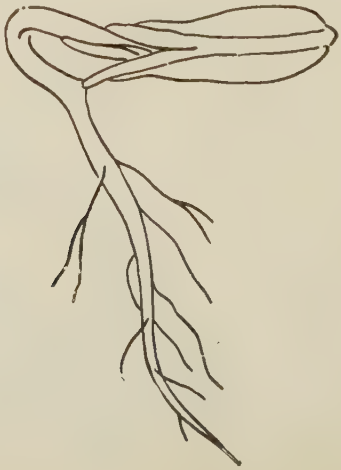




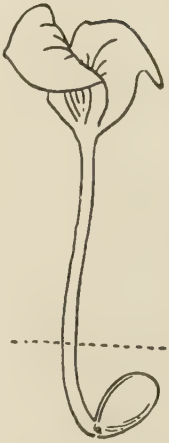
look very wise, and often seem to nod at us, as if they had something to say. Suppose they could speak and let us know just what it is that they are trying to do. What would their story be? I think we would find that, in their own opinion, the most important thing for plants and flowers to do, the thing that they are busy about from the first bright days of early spring until frost comes, the thing that matters most to them, is the making of their seeds.

"Whatever else we do," they would say, "is only just a part,—just thrown in by the way. Our seeds are the most important things in all the world. They are the reason why we grow, and why our colors are so gay. We fade away as soon as we know that they are really coming. Then the work of the flowers is over. But the work of the plant goes on until the seeds are plump and ripe, and ready to be put into the ground."

When that time comes the whole world is safe for another year. For in each seed, no matter how tiny it may be, there is a baby plant asleep waiting to be wakened by the spring. If you take a big seed like a bean or a squash seed and cut it open, you can see the baby plant inside folded in by one or two thick little leaves. These thick leaves are filled with food for the tiny plant to eat when it first wakes up. They have



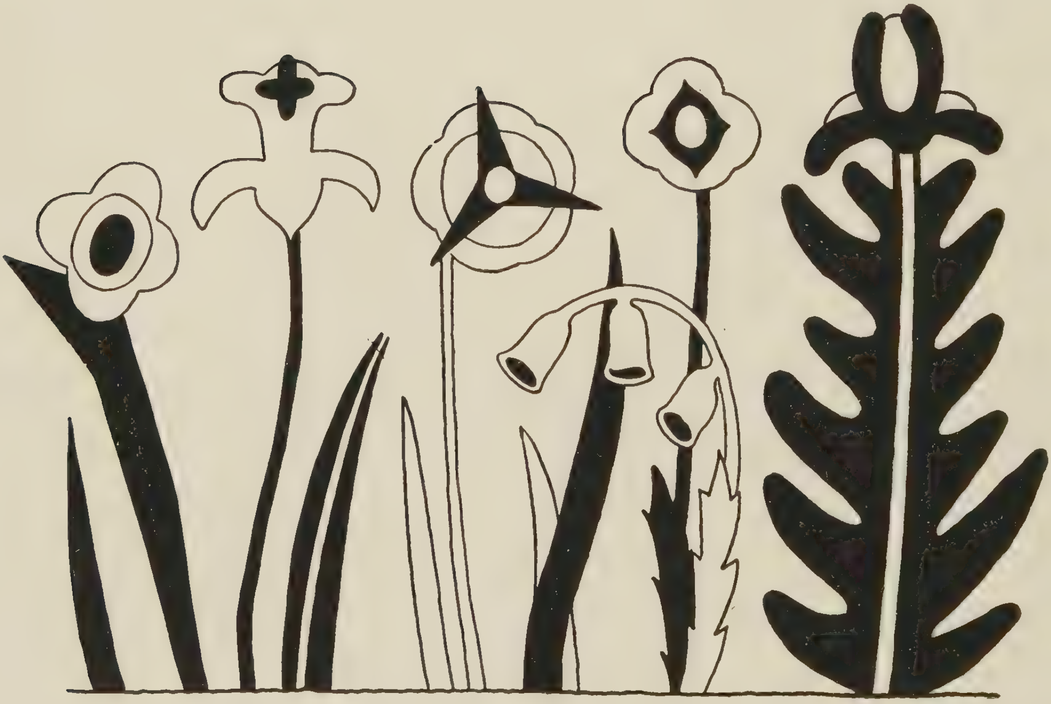
growing food, and engine food, and keep-well food of the very finest kind the old plant knew how to make. And so, very soon after it wakens, the baby plant is big enough and strong enough to break through its seed coat. Then little roots reach down below to gather up fresh food and drink, and green shoots peep through the brown earth at the top of the garden bed. As its stem grows higher the young plant puts out its leaves one after another. Then come the flower buds and later the new seeds.



And so the great work goes on in the children's garden, and in all the other gardens—in the orchards and the fields, and in Nature's gardens, in the woods and wild places. And in one way or another, the whole hungry world is fed, because, year after year, the plants keep at their work and make their seeds.

Even a tiny garden is a wonderful place, and when we make pictures of one we purposely make them as gay and as beautiful as we can. If we want our picture to make the plants and flowers look real, we must notice their shapes and colors very carefully. But if we make a picture like this one, just to remind us of them, we can use the gayest colors possible. They will help to give our picture a meaning, and to show that we really know about the garden and about the wonderful things that happen there.

Artists have some long words that they use for pictures of this kind. They call them *conventionalized* pictures or *conventionalizations.* Long as those words are, they are very useful. Sooner or later most of us are glad to know them. Look through the Source Pictures of Master Scroll A and through the pages of this book, and pick out the pictures that are conventionalizations. You will find some of animals, and some of trees and of other things as well as of flowers.



CHAPTER X

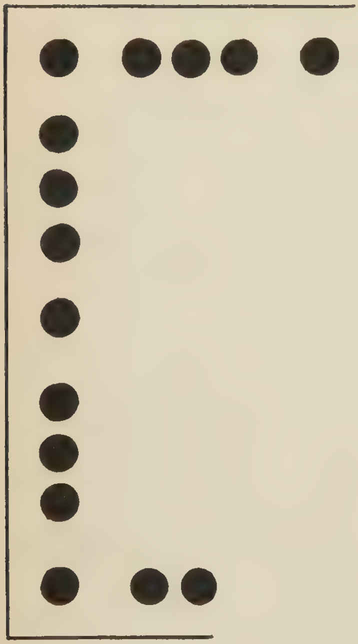
Borders and All Overs

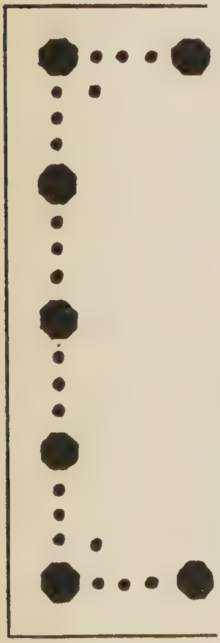
The border and all over patterns on Source Picture Number 10 were invented by some children at school. They printed them with sticks or drew them with their crayons as the little pictures show. Some they used for decorating presents that they made, birthday cards, and calendars, boxes and baskets and pictures. One or two of them they used for wall paper in their house "Where the children live," and some of them they invented just for the fun of it. For after their teacher had helped them a little, and explained some of the things people need to know about "borders and all overs," they had such fun inventing them, that they made up new ones much faster than they could use them. And this was a very good plan, as they soon found out. For then, when they really needed a pattern, they had ever so many to choose from, and could pick out the best ones.

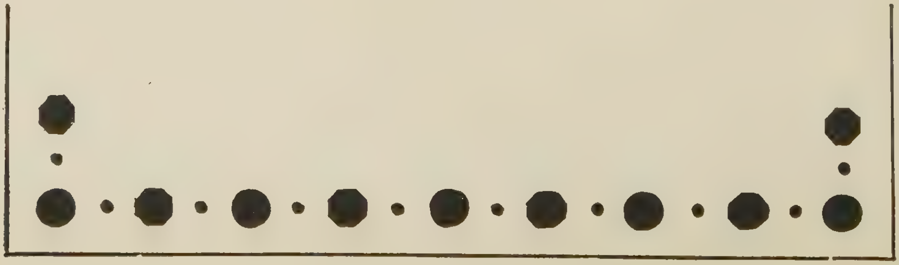
The first patterns they made were borders that they printed with "sticks," little pieces of wood like the ones you see just over the paint dishes in the Source Picture. The end of each has a special shape. The little outline figures in the top row show what it is. Do you recognize our old friends, circle, semi-circle, oblong, square and triangle? There they are again, ready to help out as usual! Every one of the first six patterns have been made by putting them together in ways that these children invented. Some of the patterns remind us of flowers, and some of them are just interesting ways of putting the shapes together, and do not remind us of anything.

When the children did their stick printing, they made the paint from their Hy-San Colors very carefully. Their teacher told them it must not be too thick, and that all the tiny pieces of crayon must be dissolved in the water. They put a small piece of blotting paper into the bottom of a little saucer and poured the paint over it. Then they pressed the end of a "stick" into the blotting paper, and stamped it on a piece of "practice" paper. If their paint was the right thickness and they pressed the stick down evenly, the print looked very nice on the paper. But often they had to try a good many times before they were satisfied, and could begin stamping the presents they were making. They found the print of the stick was more even when they put something soft and thick underneath their paper. So some of them brought folded newspapers to school, and some made pads of heavy cloth and brought those.

The very first patterns they printed, were made with the ends of their pencils. Some of the pencils were round and printed circles, and some had six little sides and made a shape their teacher called a "hexagon." Whichever print a child's pencil made was

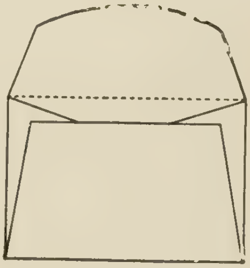


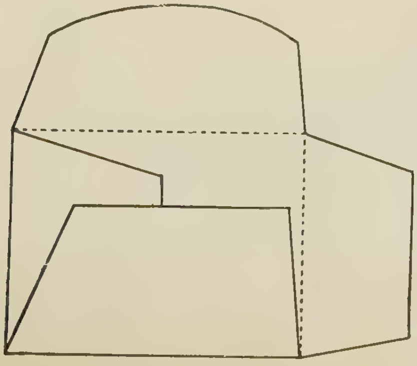


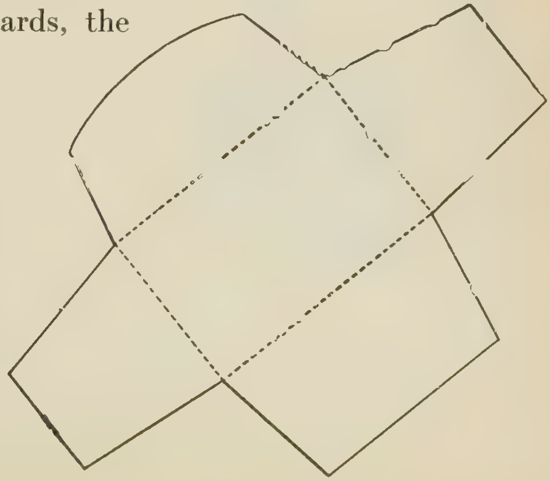


called his "unit." They took pieces of paper the right shape for a birthday card. Then they chose the colors they wanted to use, and each made a border by repeating his "unit" all along the edge of his card. Some of them took their rulers and measured the places where the units should go. Some put a pencil dot at every inch, and some put one at every half inch. Then they could print their units right over the dots and make their borders even. Some of them drew lines above and below to mark off their borders. On page 122 you can see a few of the different patterns that they made. Some just put their units an even distance apart—some grouped them in twos and threes. One boy made his border by putting three circles close together and then leaving a space, then putting in one circle, and leaving a space, then three circles again, and then one. Some of the borders were done in two colors, first a red unit, then a blue one, or first a yellow, then a green one. Their teacher told them this was called "alternating," and that they could alternate the shapes as well as the colors of their units.

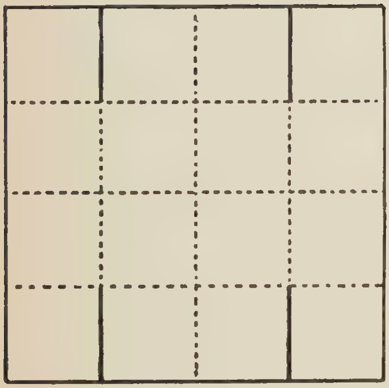
So then she gave them each a match and told them to try alternating the print of the match end with the print of the pencil end. So they made some borders of that kind. The big unit made by the pencil end they called a "strong unit," and the little one made by the match end they called a "weak unit." They liked the borders that they made in this way, and if you look at the ones they invented afterwards, the







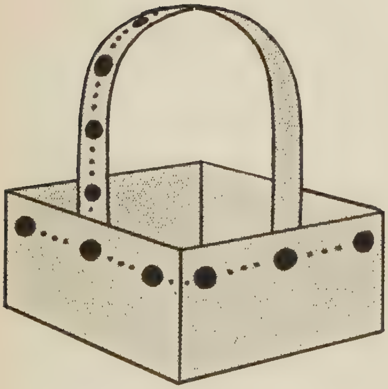
ones on the Source Picture, you will see that nearly all of them are made of strong and weak units that alternate. First one and then the other is used. These borders were made with the little sticks that come in special sets for stick printing.

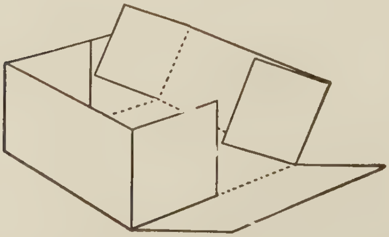


The first one, A, was invented by a boy who put it on a birthday card. The border went right across the bottom of the card. He put a red flower at the top in the middle, and a yellow flower in each of the top corners. Then he printed the words "Happy Birthday" on it, and made an envelope for it, like the one in the picture. He put some flowers on the envelope too.

Border B was invented by one of the girls who made a paper basket. The yellow flower is the strong unit in her design. She made it with the half circle and used the little square for a stem. The straight blue line between each flower is the weak unit. It seems weak because it is so narrow. You might say her border is made of a wide unit and a narrow one. But it is also made up of a bright unit and a dark one. The pictures show how she made her basket. It was of very stiff white paper. The ends were pasted in place and the handle was pasted on. When it was done she filled it with nuts, and put it at her father's place on the dinner table to surprise him.

Border C is made with a tall unit and a short one. The colors of both are the same. It is its size that makes the strong unit important. A little girl put this border on the sides of a paper box. She arranged the big and little units separately on the cover so



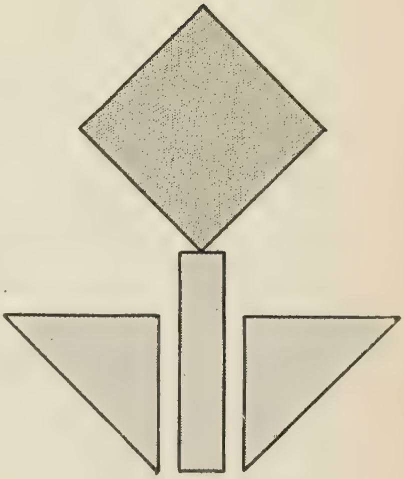


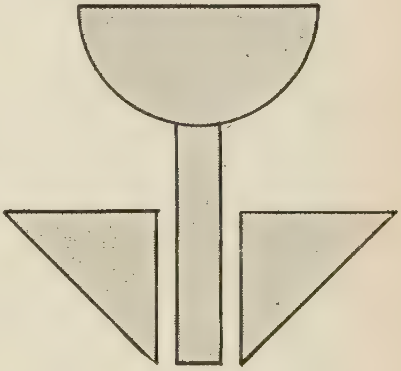
they should look pretty and match the sides. The pictures on page 126 show the way she cut and pasted the box.

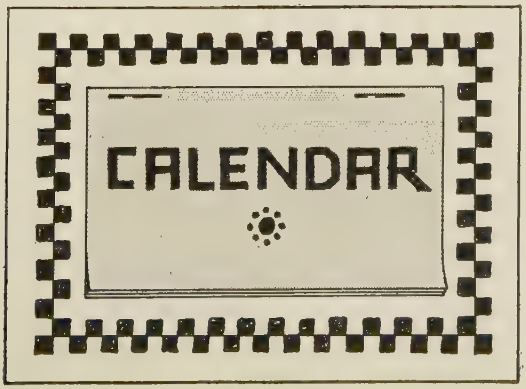
Border D was invented by a boy who stamped it all around the edges of a card, and pasted a printed calendar in the middle. As you see he used only one unit. But he used it in such a way that his border alternates like the others. In order to get it on evenly, he drew a light pencil line through the middle of his border space. Then he stamped his squares first above and then below the line.

His unit is the simplest one on the Source Picture. The flower unit in the first one (A) is the hardest. For in that border each flower is really a strong unit and each leaf a weak one. But by grouping three small units together, the flower with a leaf on each side of it, we make a larger unit, and of these larger units the strong one is the red flower, with its leaves, for it is just a little larger than the group with the yellow flower, and its color is brighter. In this way we can start with very simple units, and build up harder and more interesting ones.

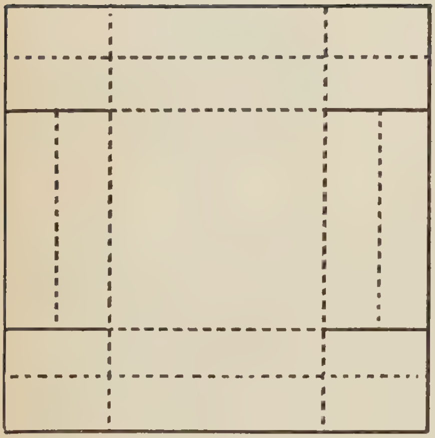
But no matter how simple or how elaborate our units may be, border patterns are all alike in certain ways. The units in them must be repeated over and over in one direction. That is the first thing to remember. Sometimes we repeat them across, putting each unit beside the next one to the right or left. Sometimes we repeat them up and down, putting each unit above or below the next one. Then if we have





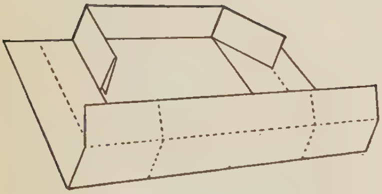


strong and weak units, we must alternate them. That is the second thing to remember.

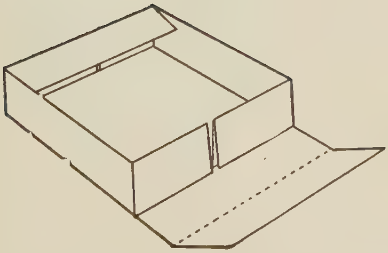


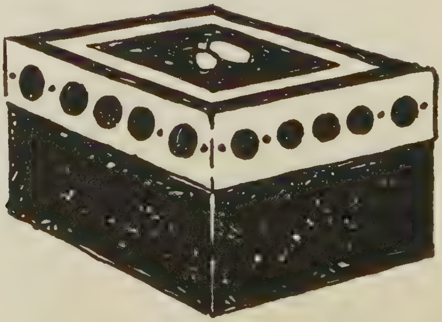
Patterns like these are sometimes called "rhythms" because their strong and weak units alternate in the same way as the rhythm or pulse that we feel in music and poetry. If you say or sing over a line or two of some song,—"London Bridge," or "Oats, Peas, Beans" for instance, and especially if you "keep time" by clapping your hands or tapping on your desk as you sing it, you will see how the strong and weak pulses of the music alternate, just as the strong and weak units alternate in these border rhythms.

In an "all over" pattern the units are repeated in two directions, from side to side and, also, up and down. In this way we cover the whole surface of our material,—paper, cloth, or whatever it may be, and so people often call them "surface" patterns. Patterns E and F on the Source Picture were invented by two boys just for the fun of it. But they liked them so well they wanted to use them afterwards. So their teacher told them about making books with end papers in them. She explained that very beautiful books are often made more beautiful by putting decorated end papers inside their covers. The pictures on page 127 show you how these boys made their book covers and how they pasted in the end papers.

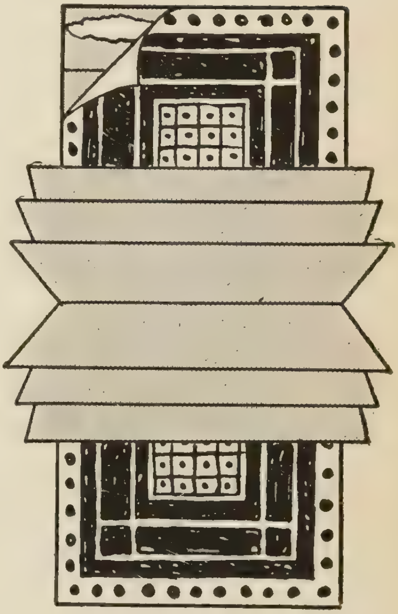


You will see that each all over pattern on the Source Picture has a border that goes with it. Notice the corners. Turning the corners is an important part of border making. A corner needs to be turned in such

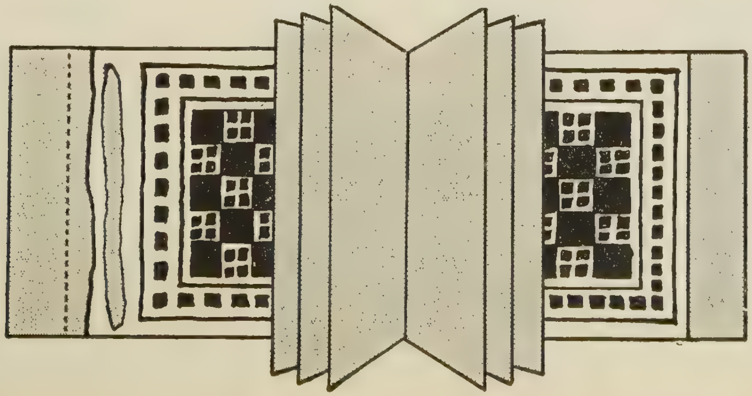




a way that the pattern shall seem to fit it, and in such a way that the border can go on repeating itself along the edge on the other side. To do this we have to make a special plan for the corner, one that shall fill it nicely and still be a part of our design. Notice the corners in the patterns marked E, F, G, K, on the Source Picture. Does it seem to you the boy who invented pattern F might have made a better corner? Could you invent a better one?



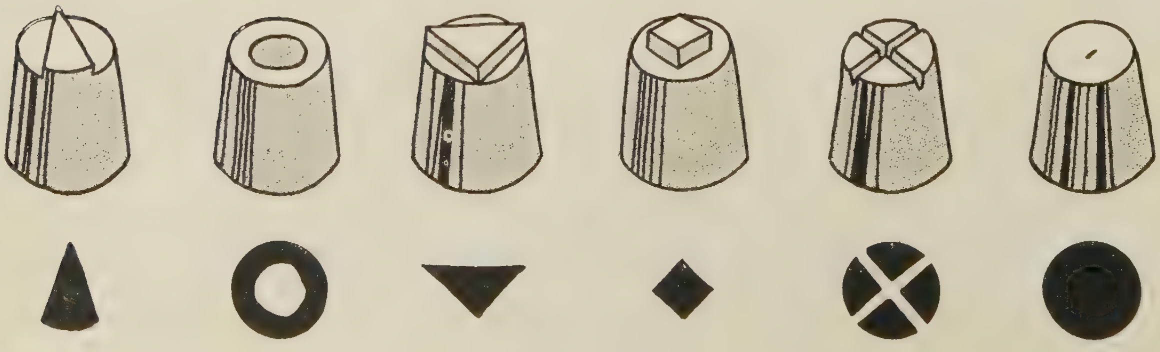
But perhaps you are wondering where to get the right kind of sticks for printing patterns like these. They cost only a few cents, but it is true that very few stores have them for sale. In the town where you live there may not be a single store in which you can find them. However, you can always make your own. Begin by using pencil ends and the ends of burnt matches, as these children did. Then, if you set your wits to work, you will find there are all sorts of things that will make interesting units, and can be had by anyone who uses a little invention. The end of a spool can sometimes be used, if you want a big circle with a hole in it. The head of a clothespin and its "feet," too, can be used. The end of a wooden ruler will make a unit of another kind. A piece of small doweling can be cut into short lengths, if you have a little coping saw like the one on Source Picture Number 19. The ends can be smoothed with sandpaper, and then cut into patterns of different kinds with a knife or with a little file. Bottle corks are easier to get, and easier to cut into the shapes you



need. It is a little harder to print with corks. They do not take the color quite as well as the wooden sticks do, but by experimenting, and making your paint just the right thickness, you will find that you can use them. Some people do very good stick printing with pieces of raw potato. These can be cut into the shapes you wish to use with a vegetable knife. It is possible, too, to use other raw vegetables such as carrots or turnips in the same way.

The children invented the last three patterns on the Source Picture when they were making wall papers for their house "Where the children live." They drew them with crayons, and were very careful to get the spaces even. The little pictures above Pattern G show how they marked off inches and half inches on an envelope, and used that to help them put in the pencil dots beforehand.

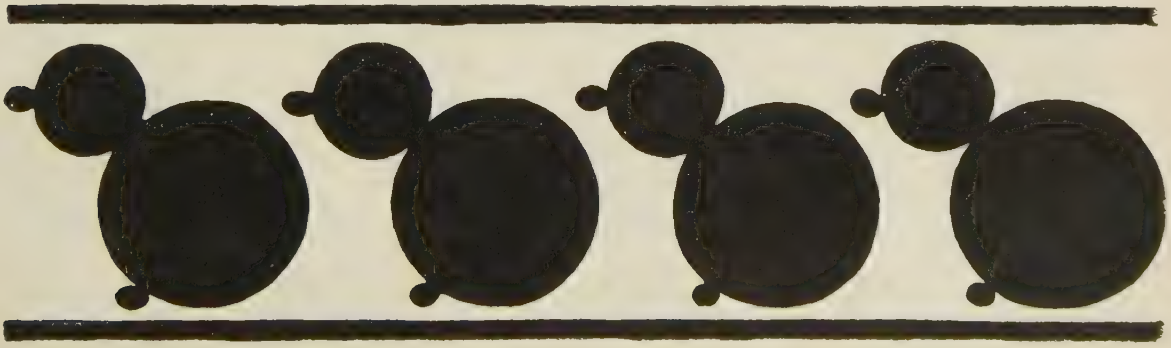
The girl who invented Pattern H, first measured off spaces just an inch apart on her paper, and then drew the slanting flower stems from dot to dot. She stick-printed the flower cups and the tiny leaves on each side of them. But when it was finished she found her pretty pattern was not a very good one for wall paper. The dark lines were too strong, and the teacher told her a room could never look restful or be really attractive with a pattern of that kind on its wall. So she made a book, and used her pattern for the end papers instead. If you look at Source Picture Number 1, you will see that John and Mary used a pattern very much like hers, for the frieze they put on the



wall of their living room. We can often do that—use a border made of units that would never do if we used them in an all over and put them in the same place. A frieze is just another name for a deep border at the top of a wall.

Of course these children invented a great many patterns besides those you see in the Source Picture. Sometimes they used animals and other things such as boats and autos for their units. By making them with the shapes they used for stick printing,—circle, square, oblong and triangle, they conventionalized them, just as the flowers are conventionalized in the patterns on the Source Picture. On this page you will see a border pattern they made with chickens for units. Some of the shapes were made with bottle corks. A large cork and a smaller one made the circles for the chicken's head and body. The bill and the foot were tiny orange circles, one made with a stick and one with a match.

The boy who made the top border on page 130 put his circles so close together you can hardly see the chickens. His border seems more like rows of circles put together in an interesting way. Many good patterns are like that, drawn so that we almost or quite forget what their units are intended to be. The legs of the chickens were drawn with a brush after the circles had been stick printed. Notice how long he made them, and how the feet of the chickens in the lower border are brought forward to balance their heads and bills.



The lower border on page 131 has a duck for its unit. One of the girls made it, because she wanted hers to be different from the others. She put in some extra lines to make her border more interesting.

One day when they were making up borders, one of the girls told about a beautiful white dress she had seen in the window of a store. She said it had a picture of a boat painted on each sleeve. They looked so real, she said, they seemed to her about the best boat pictures she had ever seen. Some of the children began to laugh at that. They wondered why anyone should want boat pictures on a dress.

"Why not a steam engine?" asked one of the boys.

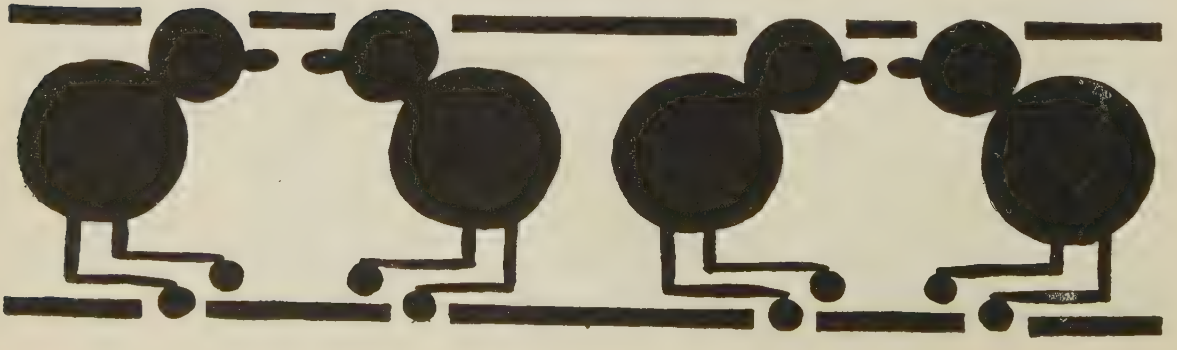
"Or trolley cars!" said another.

But the girl who had seen the dress thought boats were different.

"A sail boat has a lovely shape," she said. "And the pictures had hills, and sky, and water in them, all in the most beautiful colors."

So the children asked their teacher what she thought about it, and she said no doubt the colors looked pretty on the white dress. But even so, to have hills and sky and water and boats on the sleeves, was not good art, no matter how beautifully the pictures might have been painted, or how fashionable the shop may have been.

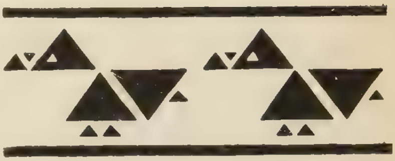
"The place for pictures that are painted to look real, is on the wall," she said. "Realistic pictures are never used by fine designers for decorating. When they decorate, their aim is not to make things that



look real, but to fit the spaces that need decorating with shapes and colors that will seem to be a part of the thing decorated, and not be separate pictures all by themselves."

Then the children began to understand.

"Perhaps some of our own borders and all overs would have been better on that dress than the boats," said the girl who had seen them.

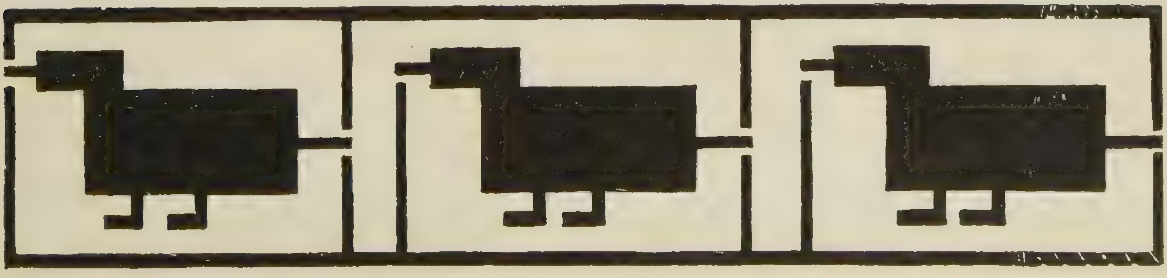


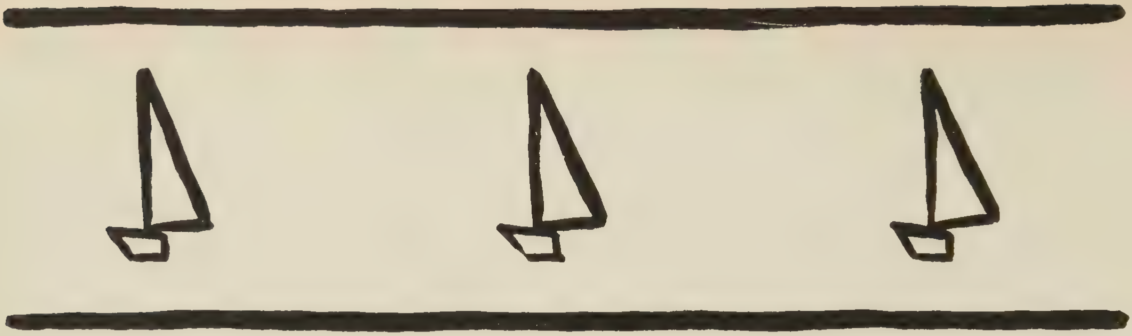
"Yes," said the teacher; "because your designs are conventionalized, and conventional designs are by far the best for decorating."

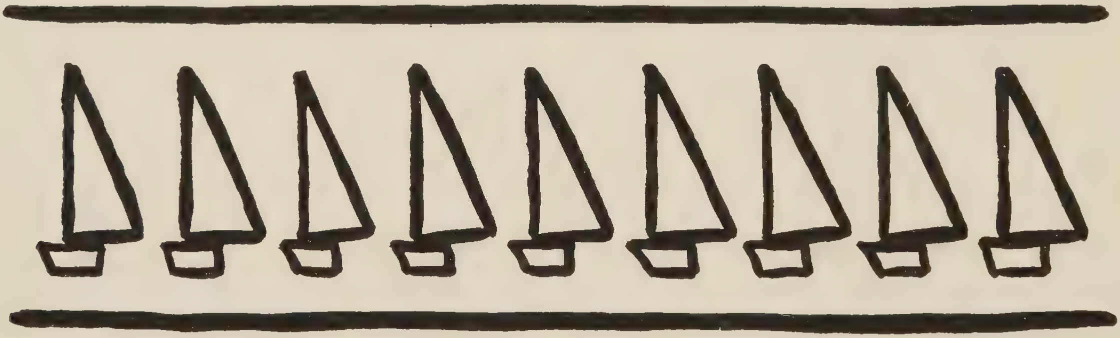
"But sail boats are so pretty," said the girl.

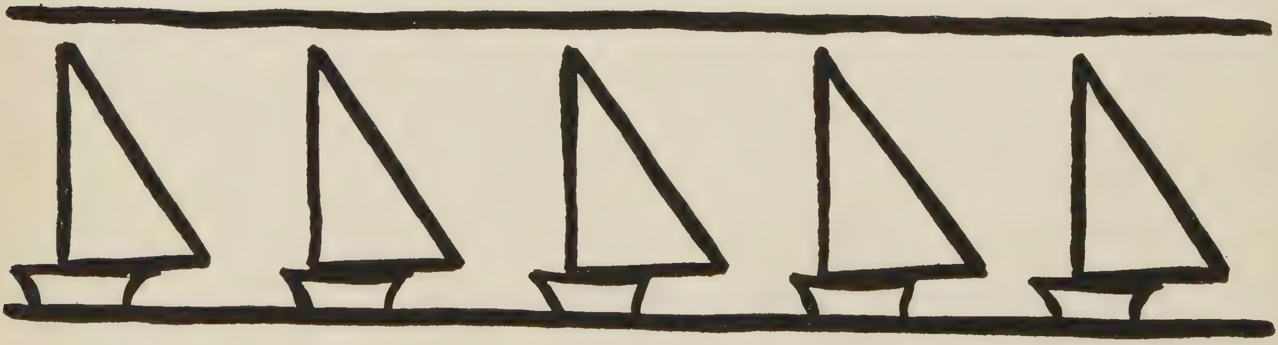
"True," said her teacher, "and we can conventionalize them just as well as other things. Their graceful lines make beautiful patterns. But the more we can conventionalize them, and the less real they look, the better suited they will be for decorating anything like a dress."

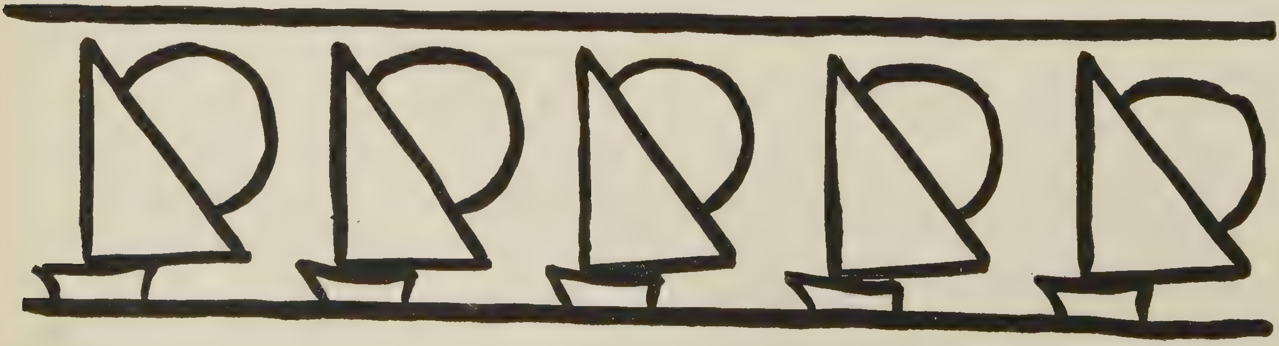
On page 132 you will see some boat borders that the children drew freehand. They used their paints and brushes for them. In freehand drawing, as perhaps you know, you never use a ruler or anything of that kind to help you measure the spaces, or make your lines straight. You trust to your eye and trust to your hand to get the lines and spaces even. When the children did this freehand work they drew their units very quickly with the point of the brush, and filled in the colors afterwards. By practicing a great deal they learned to draw the long lines at the top and bottom of their borders without using a ruler. To





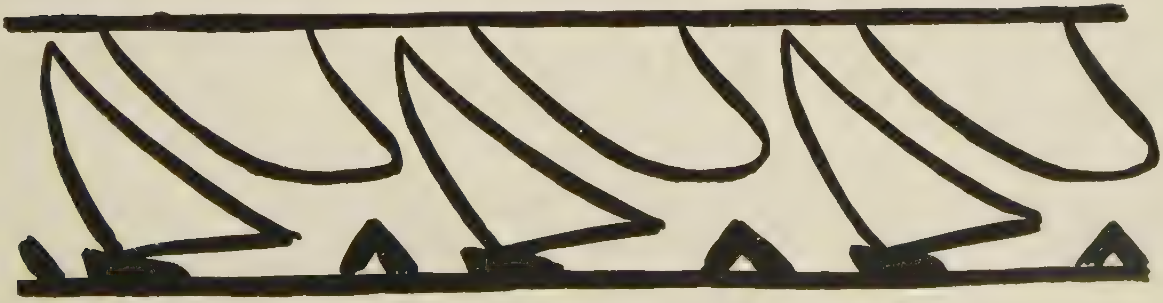


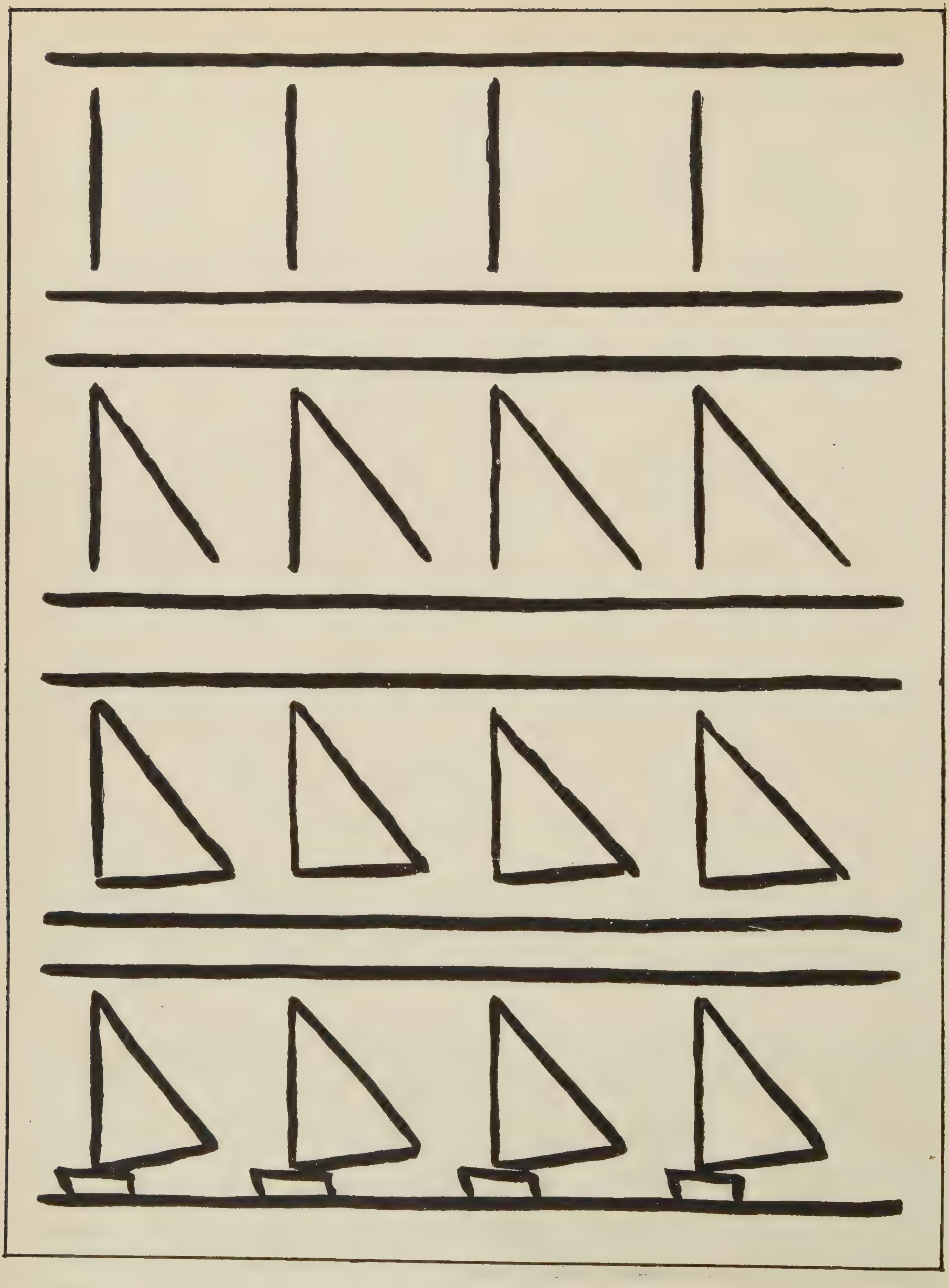




be sure they could never make them as straight and perfect as if they had ruled them. But if they could only make them fairly straight, their patterns were more interesting. And that is always so. In an Art Museum you will often see vases and tiles and other beautiful things that artists have decorated in free-hand design. They are always more interesting than the very perfect ones made by measuring, and the still more perfect ones made by machinery. The little, imperfect places in beautiful, handmade things, show that they have been made by hand, and give them greater interest and charm. For the same reason it is more interesting to hear a real person singing, than to hear a phonograph record, even of the same song, sung by the same person. The real person sings the song a little differently each time, but the phonograph sings it always in just the same way.

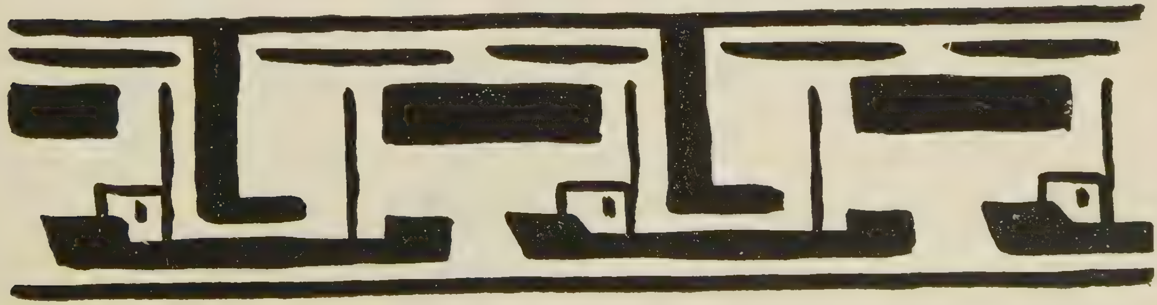
The boy who drew the first boat border on page 132 put his boats very far apart and made them very small. The boy who drew Number 2 put his too close together. Number 3 was drawn by the girl who had admired the boats on the dress. Her boats were a good size for the width of her border, and a good distance apart. But the spaces looked empty at the top. Someone suggested that she put a big moon back of the sail, so she did. Number 4 shows her border after the moon was put in. She made the moon and the hull of the boat orange, left the sail white, and painted the background blue. Then one of the boys who liked her border drew the one below. He made his sail



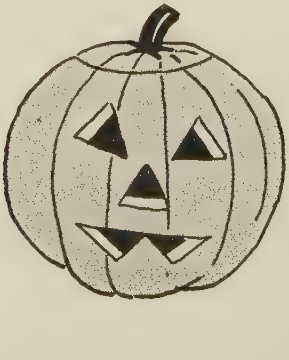


boat look as if the wind was blowing, and put a big cloud between the sails instead of a moon. And he put a dark buoy on the water between each boat. In this way he filled in his spaces and made his border more interesting. But the children thought even his border looked too much like a real boat to be put on a dress. So they asked their teacher to draw them one that would do. And their teacher drew a border and used a freight boat for the unit. At the bottom of this page, you will see the border that she drew. You can see that the lines are like the lines of a freighter, but they do not stand out and make a separate picture. They are just parts of a design that is pleasing, and graceful, and could be used almost anywhere.

When you are inventing patterns, and learning to draw them freehand, remember each one of your units needs a space of the same size every time you use it, and the different units together take up a space of the same size each time you repeat them. In Border Number 5, the buoy, the boat and the cloud together, are the units that are being repeated. All together, in the position you see them, they make what artists call the "unit of design." In Border Number 4 the unit of design is the boat with the moon back of it. It takes just so much space to draw your unit of design, and when it is repeated, it will need just that much space again. So your whole border must be divided into spaces of that size. If you were measuring it, the first thing you would do would be to mark off these spaces. When you are drawing your border

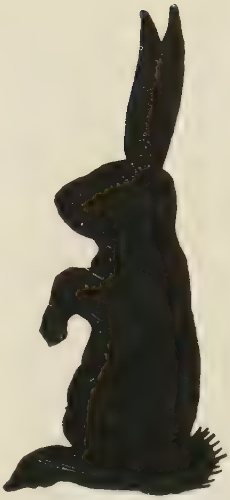


freehand you will find you can keep the spaces very even and make the units more nearly alike, if you draw one line at a time and repeat it all across the border. Take the little girl's boat border Number 4 for instance. When she drew that she first drew the long lines at the top and bottom of the border, then she put in all the masts beginning at the left-hand side of her paper, and drawing them one after the other very quickly across the whole border. Each time she began at the top of the mast and drew down. As she went along she tried to keep them just the same distance apart. She also tried to make them all about the same length and keep them about the same distance from the top and bottom lines of her border. And because she worked fast, and yet carefully, she succeeded in making them quite even. You will find you can keep them even too, after you have had some practice at this kind of drawing. And the row of masts really measured off the spaces for her design as you see. As soon as the masts were drawn she went back to the left side of her border and put in the next most important line. That was the slanting line of the sail. So she drew the sail lines all across, and tried to make them all slant the same way. Then she put in the boom at the bottom of the sail, and then the hull of the boat. Last of all she put in the moon. In this way you see she was able to space her border evenly, and because she repeated her units, line for line in this way, she made them all very much alike, much more alike than if she had tried drawing each one sepa-



rately. Try drawing this border as she did, and then try drawing Number 5 in the same way.

You will find it a great help to practice drawing borders like this with your crayons on the green drawing board. Practice drawing the long lines at the top and bottom of the border until you can draw them straight every time. To be sure, using the crayon will not help you to draw with your brush. Even though you make splendid crayon lines, you will find only practice with a brush can make your brush strokes even and sure. But drawing borders like this with a crayon gives you practice in spacing, and a good many other kinds of practice that will help you in the freehand brush work, and in other kinds of work as well.

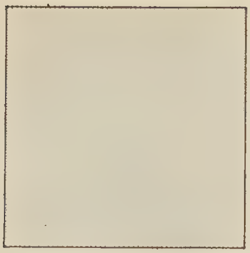


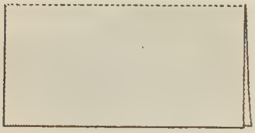
When we are making the greeting cards we send to our friends on holidays and at festival seasons, we often use symbols as the units in the designs we put on them. For example, we use hearts on our valentines, and stars and pine trees on our Christmas cards, and eggs and bunnies and flowers on our Easter cards, shamrocks for St. Patrick's Day, and pumpkins, brooms, and witches, at Hallowe'en. All of us know these special units and the days when people use them, and sooner or later, we all want to draw or paint most of them.

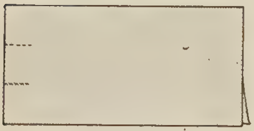
When we are planning a greeting card, we often paint a picture on it and make the picture the most important part. Sometimes we print a message on it, and make that the most important part. In that case

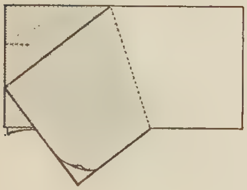
we generally take pains to invent an attractive border to put around our message. Occasionally people make use of an "all over" pattern on a greeting card. Indeed, there are almost as many different ways of making greeting cards as there are children to invent them.

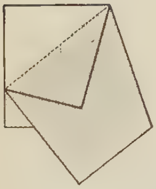
One of the units that we very often want to use in making a design, one that is used by boys and girls all over the world at Christmas time, and by American boys and girls on Washington's Birthday, and the Fourth of July, is the five-pointed star. It is very hard to draw, and it needs to be well shaped. Did you ever hear the story about Betsy Ross who made the first United States flag? They brought her the pattern for the flag, and the stars on it all had six points. That was because the men who planned it did not know how to make a good five-pointed star. When Betsy saw it she suggested that a five-pointed star would be better, and she made a little pattern with a piece of paper that she folded and cut in a certain way. Her pattern has been followed ever since. It made the five-pointed star that you see today on the flag of the United States. The pictures on this page show you how Betsy cut her star. The pattern will make a larger or smaller star according to the place you cut it, higher up or lower down, after you have made the five folds necessary.

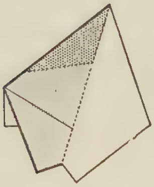


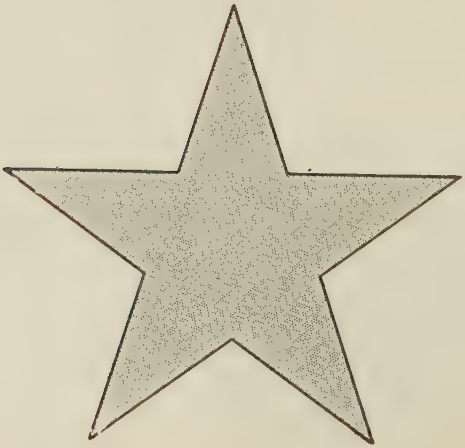












CHAPTER XI

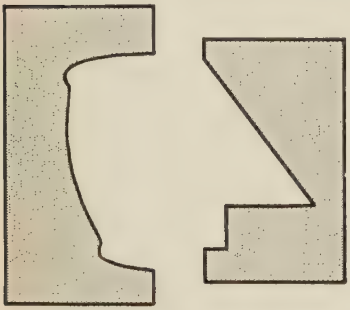
Stenciling

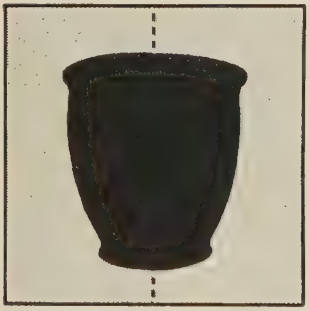
A stencil is a kind of cut-out. Perhaps it could be more truly called a "cut-in." For instead of cutting away everything except the picture or design that we are making, we cut that part away and leave our paper with the pattern cut in it. Source Picture Number 11 shows how a stencil is made and how it is used for stenciling afterwards. The stencil is laid flat on the surface to be decorated. Color is washed over it with a brush or with a crayon. Then, when it is lifted up, the picture or design that has been cut in it, is left on the surface underneath. This is called the "impression" of the stencil.

The impression may be used all by itself as a decoration, but it is more often used as a "unit of design," and repeated to make border and all over patterns. As you see, two of the stencils in the Source Picture have been repeated to make border patterns. The one that is being painted, however, is being used all by itself.

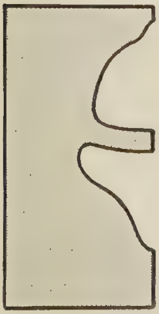
A stencil should be made of heavy paper. Wrapping paper that is tough and strong does very well. It comes in bigger pieces than some other kinds—manila drawing paper, for instance. The heavy "Oak Tag" paper that is sold in school supply stores makes a very good stencil, too, it is so thick and strong. But most of us will be satisfied to use wrapping paper and save our pennies.

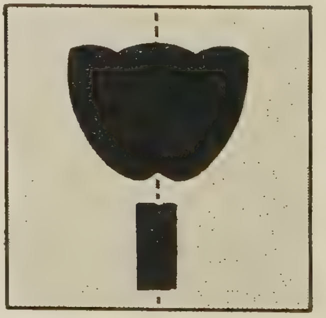
When we plan a stencil, we have to remember that the cut-out parts must be separated from each other. That is important if the stencil is to hold together. So, for example, when we cut a flower and its stem, we do not try to join them. We leave a little space between them when we draw our pattern and that leaves a strip of paper between them when we come to do the cutting out. If you look at the little stencil patterns on this page and the next, you will see how this has been done in all of them. The acorn and its cup are separated. The plant on the stencil lettered D in the Source Picture is separated from the bowl in which it is growing. Even the edge and bottom of the bowl are cut in two pieces. Often a pattern is made more interesting just because of these separations in it. That is true of the bowl, because by cutting it in two pieces we call attention to the heavy edge at the top.





The flowers in the first three border patterns on Source Picture Number 10 can easily be made into stencils as the pictures on this page show you. But when it comes to cutting the leaves that are part of each unit in the first border (A), we find we cannot cut

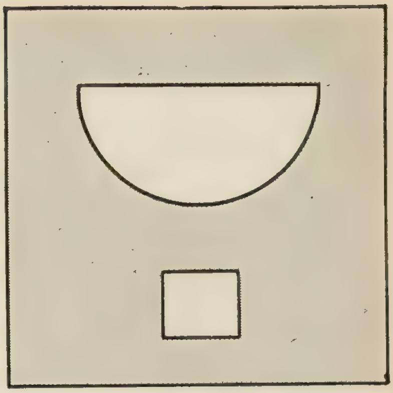


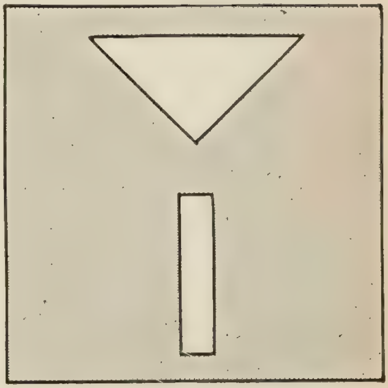


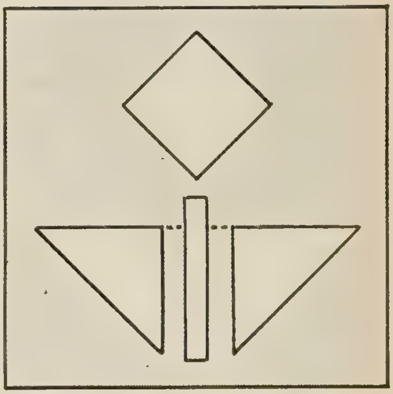
them on the fold of the paper as we can the flower cup and stem. In order to cut them we must start either by punching through the paper with the points of our scissors or by slitting the paper through from the flower stem to the edge of the leaf next it. The little dotted line in the picture shows where such a slit has been made. If we do this we must be careful to keep the slit edges close together when we paint the stencil. Often it seems easier and better to begin by punching a hole with the points of our scissors, but sometimes slitting is much the better plan. This is so when we need to make very small flowers and leaves. If you look at the stencils on the Source Picture, you will see where they have been slit in this way. The dotted lines between the flowers of the wisteria cluster (F), and between each leaf and its stem, and each flower and its stem in the milkweed stencil (K), show you where this has been done.

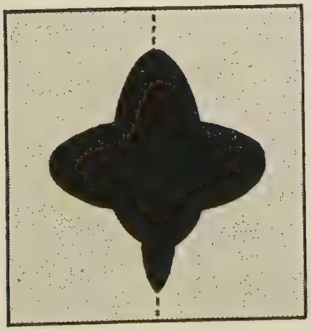
The stencils on the Source Picture have all been cut on a fold of paper. That is the best way to make both sides of a unit alike. But sometimes we wish to use a unit that is not alike on both sides. The boat stencil that you see on page 142 is a unit of that kind, and so is the duck that was cut from the little girl's border design on page 142. Units of both kinds can be made easily enough if we plan them carefully and draw them first.

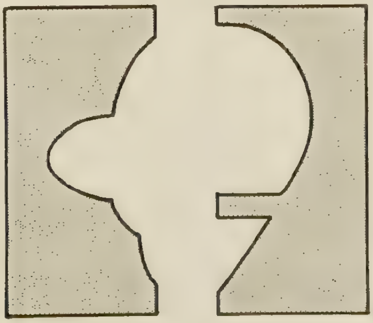
The green drawing board of your desk makes a fine

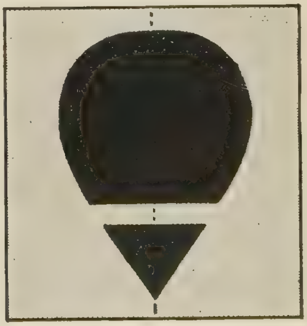


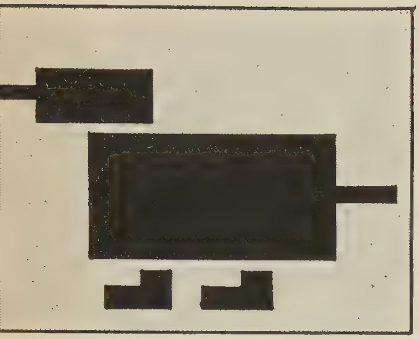






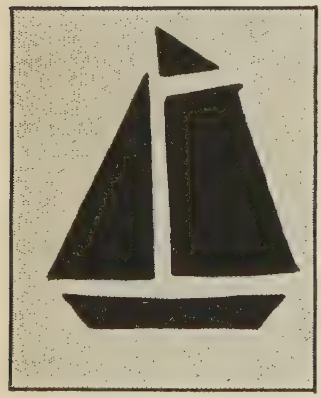




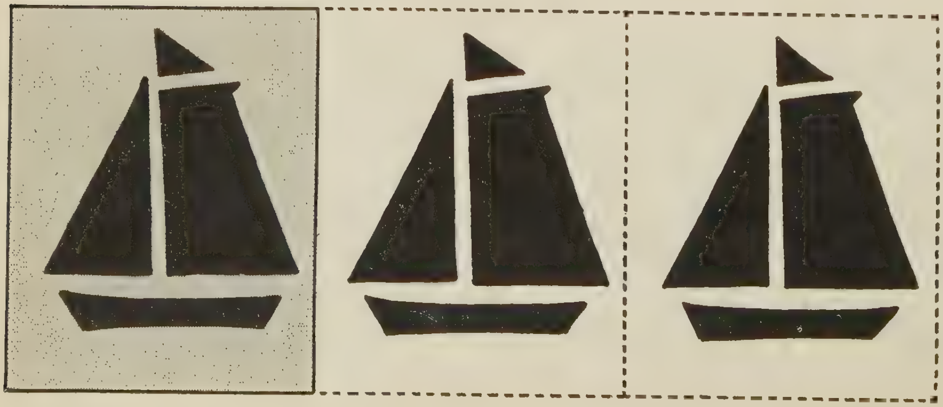


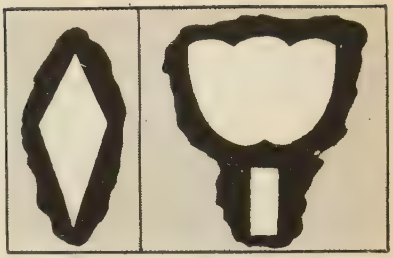
surface on which to try out stencils after you have finished cutting them. Use the dry Hy-San crayons and fill in the cut out places with them. Then you can tell from the impression whether any changes are needed to improve a pattern.

To make border and all over designs with a stencil, we use it over and over. Each time we lay it down on the surface to be decorated, we take care that the pattern shall come in just the right place with even spaces between each unit. By planning our stencil carefully we can use the edges for measuring, in the way the pictures on this page show. The dotted lines tell where the edges of the stencil came every time it was laid down, and because these were straight and just the right distance from the unit, it was possible to make the pattern even, without measuring off the spaces in any other way.



We often see stenciled patterns in which two units have been used instead of one. When that is done two stencils must be used,—one with a "stronger" unit than the other. The strong unit, as you know, is strong either because it is larger, or because the color is brighter or deeper. On page 143 you will see two stencils, a strong and a weak one, that can be used together. Try alternating them, first in a border, then in an all over pattern.

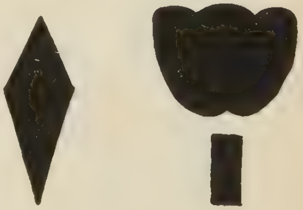


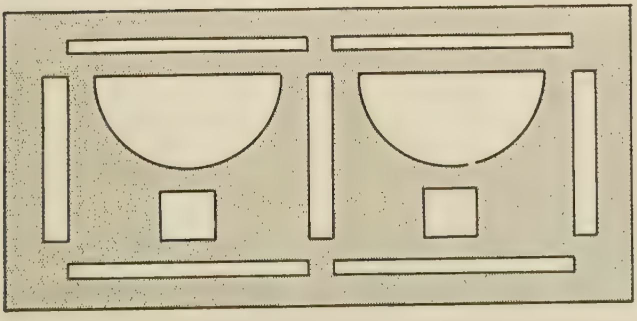


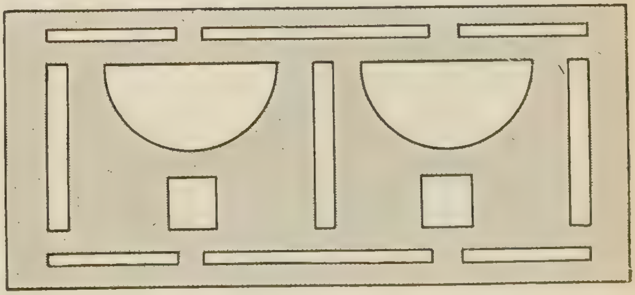
Sometimes people use their first stencil as a pattern only, and make a big stencil from it for the whole border or surface space they wish to decorate. Then they can color it all at once. This is often a good way to do, especially if the pattern is a simple one. You might try making stencil borders of that kind from the stick printed borders on Source Picture Number 10.

Try, too, putting border lines on some of them, No. 3 for instance. When we make border lines for a stencil, we have to break them up into small parts. The places where they are separated should be planned carefully to make a part of the design. Below are two ways in which border lines can be drawn to fit this pattern. Which seems to suit it best?

Artists generally make their stencils from oiled paper so that when they take impressions of them, the wet paint will not soften the edges and spoil them. If we make our stencils of plain wrapping paper, we can protect them by giving them a coat of shellac. This must dry before we use paint on the stencil, You can get shellac at any paint store. A coat of it is often put over old furniture to make it look new again, and on woodwork and painted surfaces to give them a better finish. So you may find some in a bottle or a can, among the painting materials in your own home. Put a folded newspaper down on your desk top, spread the stencil out on it, and pin it down to the paper. Then paint all around the edges of the







design with the shellac, and let it dry thoroughly. It will take about a day for it to become dry enough so that you can use paint on the stencil. When it is dry you will find you can paint over your stencil again and again. And this is necessary if you are to repeat it in borders, and in the other ways that may suggest themselves as you begin to use it.

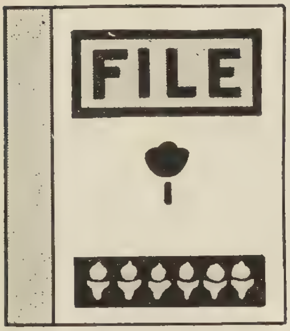
Paint for stenciling needs to be thick. Then it will not run together underneath the narrow strips of paper that separate the different parts of the design. Artists often use oil paints for their stencils. If you remember this, it will give you some idea of the thickness to mix your Hy-San Colors. The pictures on page 145 show the kind of paint brush to use. It needs to be a bristle brush and fairly stiff. They have such brushes in hardware stores, and the ten-cent stores nearly always have them. If your stencil is a fairly big one, a big brush is a great help, as it spreads on the color so much more quickly. One boy, who could not find the right kind of paint brush in the "general store" of the tiny town where he lived, bought himself a little "dauber," a brush of the kind you use for putting blacking on your shoes. This made a very good brush for stenciling. The bristles were about the right stiffness, and it was big enough to spread the paint well.

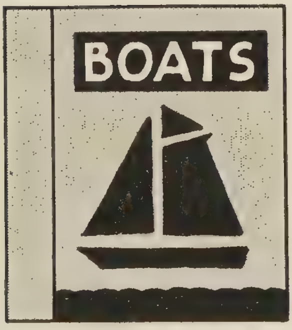
Stencils are used by decorators for many purposes. We have all seen walls decorated with stenciled designs, and stenciled curtains, sofa pillows and table

covers. When you are just beginning, however, it is a good plan to make smaller things that require less material. Then you need not be too disappointed if at first you are not as successful as you would like to be. For stenciling is not as easy as some people think. It takes a good deal of practice to make really good stencils, and it takes practice to use them well. We need to get the paint the right thickness, and we must learn, too, how to take up the stencil after the painting is done. It is easy to blur our pattern.

Begin by making some rugs, table covers, or perhaps a bed spread for the house "Where the children live," or try decorating covers for the little blotter pads that make such welcome presents when they are nicely cut and decorated. You know how they are made, by cutting blotting paper into squares or oblongs of the same size. Make a cover for the top, and clip them together with clips or tie them together with ribbon or silk, laced through holes at the side. You can decorate book covers with stencil patterns and of course, you can use them for greeting cards.

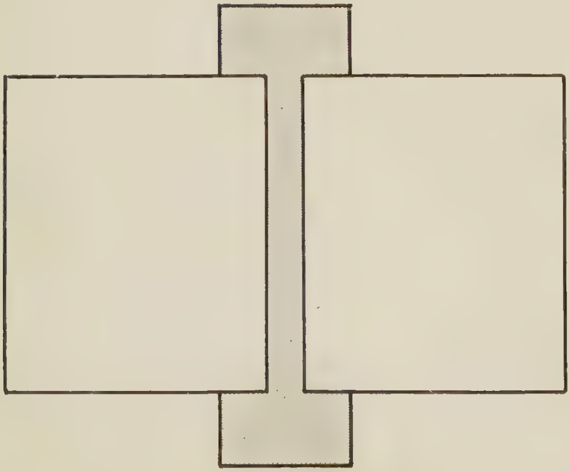
Something harder to make than a book cover, and very useful to many people, is a portfolio. Children who make a good many drawings really need one to keep them in. They are also good to hold the magazine pictures so many of us like to save. The sides need to be of strong paper board of some kind. If you can get two pieces of the heavy kind that people call "compo board," or of the kind called "binder's board,"

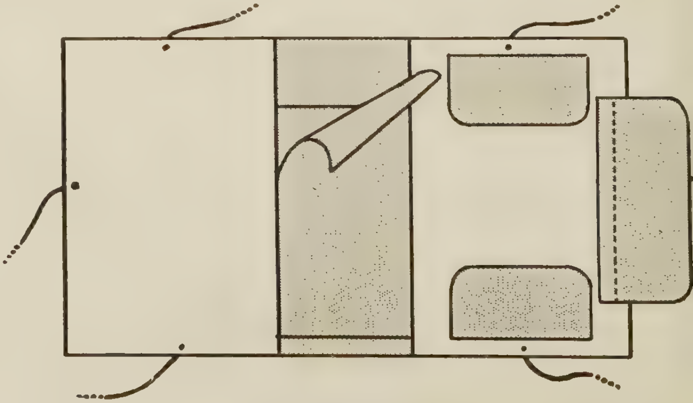




they will be just the thing. Binder's board is the heavy cardboard used for binding books. The top and bottom of a heavy cardboard box can be used, but nearly all cardboard is too light in weight to make a good portfolio, one whose covers will not bend or break. The picture shows you how the two cover pieces are held together, by the strip of tough paper or cloth that is glued to them to make the back. Another shorter strip is pasted to them inside. That makes the back double and makes it strong. At the same time it gives the portfolio a neat finish inside. The flaps that are shown in the picture, are made of the same material as the back, and glued in. It is not necessary to put them in unless you want to do so. The tapes that are run through holes in each of the three sides of the cover, will hold your big drawings inside the portfolio without the help of the flaps. But the flaps will keep smaller cards and pieces of paper inside. You will see by the pictures how the stenciled decoration can be put on.

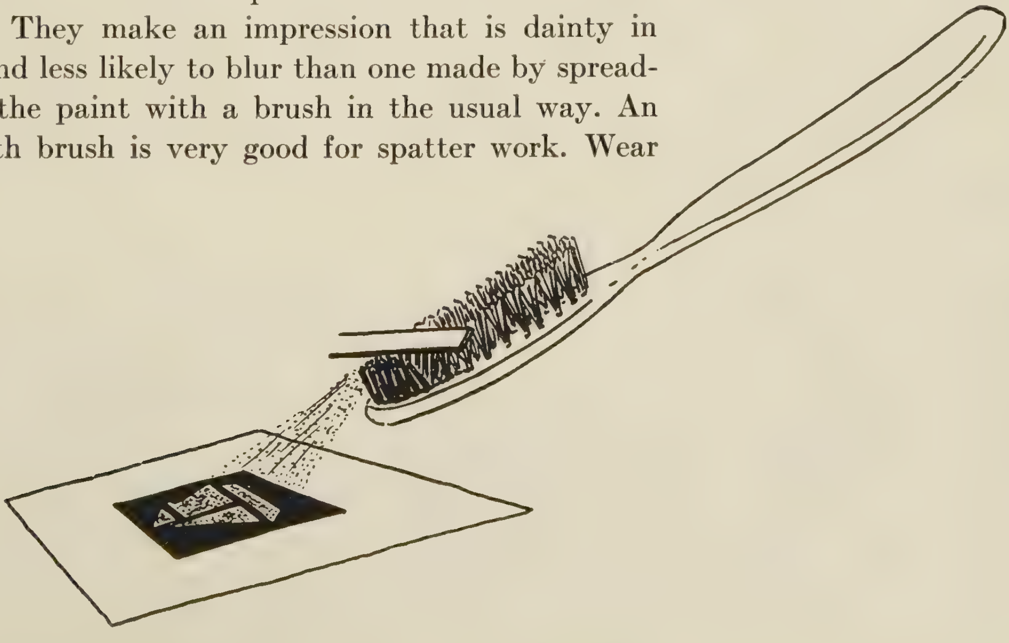
If you are anxious to try stenciling on cloth, it is a good plan to get some pieces of unbleached muslin and use that. The creamy color of the muslin makes a nice background for the stenciled pattern. A square table cover or a pillow top are interesting things to decorate. They give you a chance to experiment with border patterns, and with designs for the center space





as well. Then, too, the corners are interesting and can be turned in so many different ways. Choose one of the patterns on the Source Picture, or some of those on the pages of this chapter, and plan a way to use them for the table cover or curtains in your own room. When you stencil cloth, however, you must remember that the Hy-San Colors are water colors and will come out entirely if the cloth is washed. People who stencil curtains and table covers generally use colors of a different kind. Sometimes, however, they use what are called "fresco" or "show card colors." These are water colors and to make them "hold" a tiny bit of mucilage is sometimes added to the water in which they are mixed. So you might try a drop or two of mucilage in your Hy-San Colors when you mix them, and see if you can make them "hold" in that way. Only a very little can be used, or the paint will get shiny and too sticky to spread well.

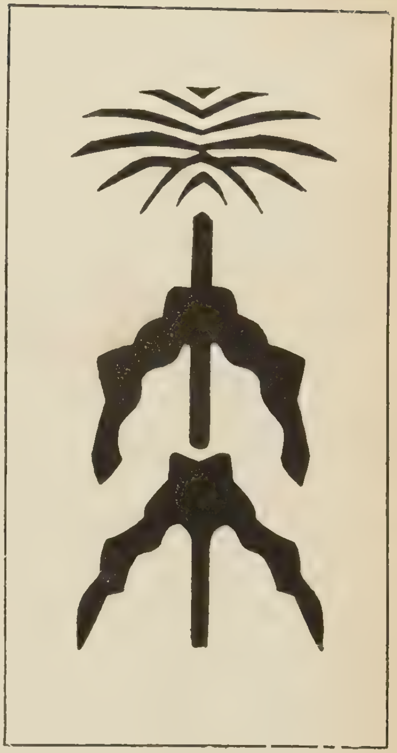
An interesting way to use a stencil is to "spatter" your color. This is done by drawing the edge of a knife across the bristles of a brush filled with thin paint or ink. The tiny drops that spatter from the brush fall on the cut out parts of the stencil in a little shower. They make an impression that is dainty in color, and less likely to blur than one made by spreading on the paint with a brush in the usual way. An old tooth brush is very good for spatter work. Wear



an apron when you do it, and put newspapers all around your stencil, so you cannot possibly spatter anything that will be damaged. Make your paint thin and do not take too much on the brush. Spatter carefully and not too fast, and let your paint dry before you take the stencil up. Some people get better results from spatter work than from any other way of using stencils. It is especially good for impressions on paper. After a little practice you will be able to spatter the color evenly over every part of the stencil, and also to shade it if you like, by spattering the darker parts several times over.

In a school where I once visited, the children of each class had made stenciled curtains for the windows in their own class room. In the fall just after school began, they had all made up stencil patterns. Then each class had voted on their own, and chosen the one they liked best for their set of curtains. They made the curtains of unbleached muslin and stenciled them in just one color. Some classes used blue, and some used red for their stenciling. Others used green or brown. When the curtains were all finished and hanging at the windows, the whole school voted on them to decide which class had made the best design.

Many people think stencil decoration should always be done in one color, like the border at the bottom of the Source Picture (Stencil D. E.), with its row of brown flowers standing up so straight and stiff. It

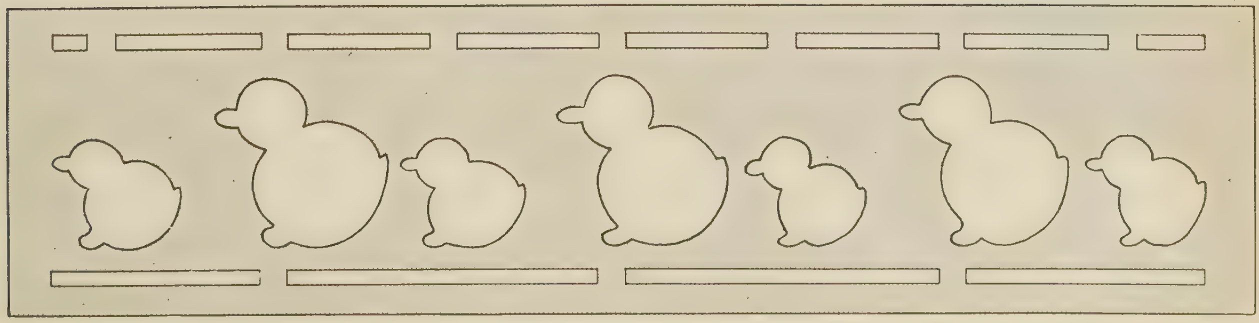


is certainly true that we think more about the design when we see it in only one color. Color is so interesting for its own sake, that it often makes us forget poor designing and even poor drawing. A beautiful design will be beautiful in black and white, and a beautiful stencil does not need gay colors to make it so. We can enjoy it just as much, perhaps better, if we paint it like this—all in brown, or in dull blue or dull red on a lighter background, or in white or cream on a dark background.

But many of us will wish to use at least two colors for our stencil, especially if it is a flower pattern. Then we can color the leaves and stems green, and the flower a gay yellow or red or blue, as the case may be.

The stencil in the upper right hand corner of the Source Picture (H. K. L.) is colored in two shades of green and the bright orange flowers at the top make a third color note. They are so small you feel they need to be very bright indeed to hold their own against all those dark leaves, and the same thing is true of the single red flower on Stencil A. B. C.

Stenciled pictures are always conventionalized. Even if we wished to do so, we could hardly make them realistic. As you look over the different flower shapes on these pages you can tell, perhaps, that one was meant to remind us of a thistle and another of a zinnia. But most of them are so conventionalized

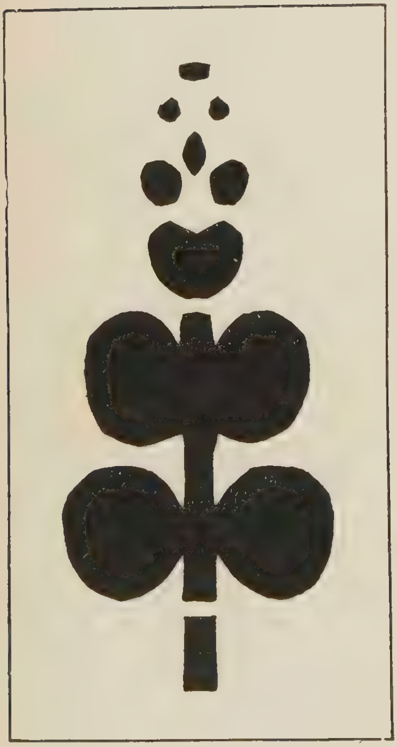


that they remind us only of a flower, without suggesting any particular kind.

Do you suppose, if you tried making stencil pictures of some of your favorite flowers, they could be recognized more easily than these? Try it and see. You may make yours more "realistic" and you may find too, that they are even more conventionalized.

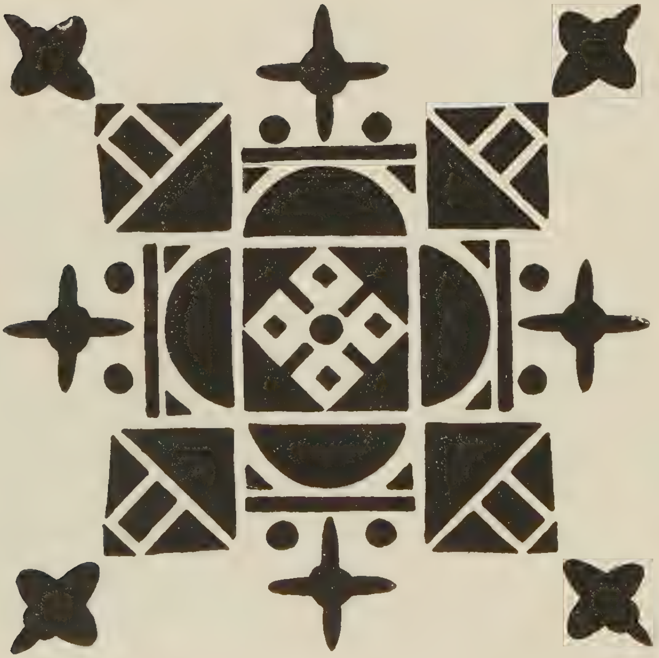
The graceful clusters of the wisteria in the lower right hand corner of the Source Picture (Stencil F. G.) look fairly natural, at least in shape, but their color is hardly the color of wisteria. That, as you know, is generally a soft lavender. Sometimes the flowers are white, and now and then we see a yellow wisteria vine. In this border the flower clusters have been painted first blue, then yellow, then blue, and if the border were continued across the end of a curtain or on the side of a wall, we would find the colors alternating, first blue, then yellow in the same way. For in this border the units are alike and the colors alternate. That is a favorite way of making a pattern more interesting and using a greater number of colors in it.

But why use this shade of blue, if real wisteria is quite another color? To be sure our wisteria was not drawn to look real, but why change the color? Perhaps you know or can guess the answer to this question. It is that the colors for this border were not chosen to make the flowers look real, nor even to



remind us of their true color. They were chosen to fit in with some color plan the artist had in mind when he painted the stencil. If they were intended as a border for the curtains of a room, they were colored to fit in with the color plan of that room. An artist would say they were chosen to "harmonize" with the other colors in the room. That they should do so is more important than that the flowers should be painted in their true colors. This is always true of colors that we use in decorating. So you see we might even make the wisteria flowers red, or orange or brown, if those were the colors that would harmonize best with a particular color plan. When we make realistic pictures, we need to make the colors of a flower or of anything else we paint, as true to nature as we can. But when we decorate we cannot always use the colors nature uses. We have to choose the ones that harmonize with the colors of whatever we are decorating. That is one of the reasons why it is better to have conventionalized units for the designs we use in decorating. It is one of the reasons, too, why many artists love designing even better than making realistic pictures. The conventionalized designs give them the chance to draw new shapes and arrange them in new ways. They give them the chance, too, to use color in new and beautiful ways of their own invention.

Some stencil designs do not have conventionalizations of flowers or of animals or of objects of any kind for their units. They depend entirely on our good friends, circle, square, and oblong, with triangle and half-circle of course, to make up units for them. And as usual, circle, square and the rest of them, do the work very well indeed. Their units repeat and alternate, and are strong and weak according to their size and shape and color, just as all design units do, no matter how simple or how elaborate they may be.



CHAPTER XII

Poster Making

LOOK at the first poster on Source Picture Number 12, the one with the words "Big Show" printed on it. Suppose you were walking along the street and saw one like that put up on the door of somebody's house. You would know right away that the people who lived there were going to have a circus. You would know, too, that they would like to have you come and see it. If that were not so, they would never have put up the poster. In the same way the second poster, the one that says, "Come to the Fair" and the last one, the "Toy Sale" poster, both tell much the same story. They have a piece of news, an announcement to make, and they expect people to do something because of it.

That is the first thing to learn about poster making. A poster is not just a picture. It is made always for a special reason, and is meant to make people act in some way. Like these three on the Source Picture, it may be inviting us to go somewhere. It may be asking us to buy something. Often it seems to be only reminding us of something, but always it expects us to *act* on what it has to say.

The middle poster on the Source Picture for instance, reminds us of "Safety Day." But to remind people of Safety Day is really asking them to act in a great many different ways—to look around before they cross the streets and railroad tracks, to put out the matches they use, and the bonfires they build, in short, to keep from having accidents of all sorts by being careful. In much the same way such posters as "Play Fair," "Be Kind to Animals," "Keep the Laws of Health" that you see on some of the pages of this chapter, remind us of things we ought to do, and expect us to act accordingly.

But perhaps you have made posters at school and already understand about them, and the way they are used. At school posters are often needed for one reason or another. When a class is giving a party or a play, or having a sale of some kind, a poster is the very best way to let the rest of the school know about it. Then teachers often ask to have posters made—health posters, and "special day" posters, to remind people of such days as Arbor Day and Thrift Day, or Columbus Day, and the birthdays of great men like Lincoln and Washington.

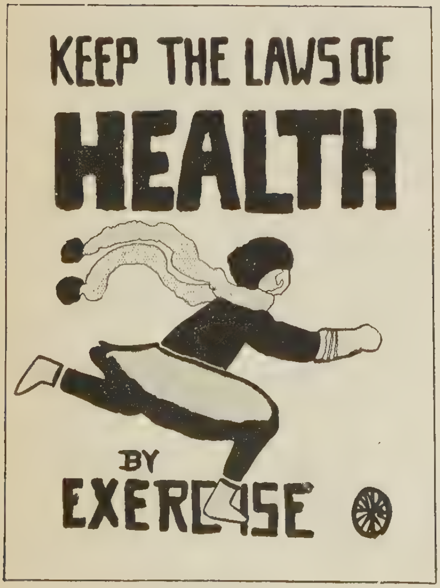
But very many children have never thought of making posters to put up at home, where people often need to be reminded of special days and holidays quite as much or more than they do at school. On Mother's

Day and on Father's Day, for instance, a poster at home is worth more than any number at school, especially if you make it as a surprise. Mother's Day comes on the second Sunday of May, and Father's Day on the third Sunday of June, and ever so many people forget all about them until it is too late to do anything to celebrate.

"Play Fair," "Share Your Toys," "Be Kind to Animals" are messages that might be used on home posters by anyone who needs reminding of such things. Of course the whole point in making a poster of this kind lies in making it for ourselves to help *us* think of something. We have no right to expect our brothers and sisters to enjoy posters of that sort that *we* make for *them*. I know a boy who made a poster for his own room and put on it the pictures of his pet dog, and his chickens. At the top he printed the words "Feed Us" in big letters. Another good home poster was the one a girl drew with a clock on it. The hands pointed to nine o'clock and the words said "Be Prompt." Then I once heard of a boy who had trouble remembering an important thing and made himself a very helpful poster with a white rabbit on it. The words said "*He* washes behind his ears!" So, as you will see, a home poster may be useful in many ways. On festival days one or two big ones in gay colors help wonderfully to decorate the house and give everybody the right holiday feeling.

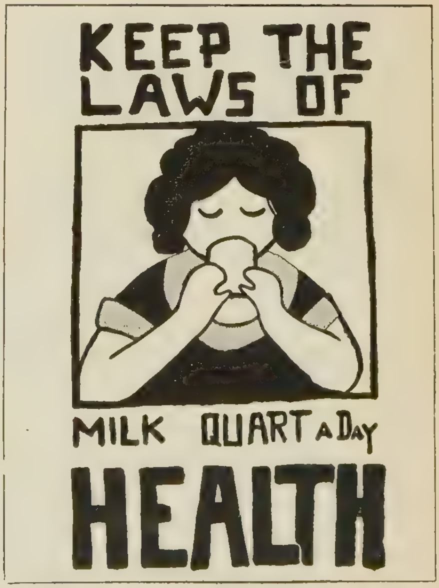
Among the posters on the Source Picture and those on the pages of this chapter there may be some that you can copy and use just as they are. Indeed you may like to copy all of them at one time or another, just for the fun of it. But you will soon find that inventing your own is far more interesting than copying one can ever be. The most important work on a poster is done by the person who first thinks out the way to tell the message and plans the design. When you have once begun to do that you will never be satisfied just to copy them, for you will realize a copied poster is never really yours, no matter how hard you work at it. At the same time you can learn a great deal about posters by studying those on the Source Picture and in the book, and perhaps there is no better way to do that than by copying them at least once on your drawing board, or on big sheets of paper with crayons, paints or cut-outs. Then you will find out a good many things about them that you might not notice otherwise, and that will help you when you come to invent your own.

Posters are made in different shapes and sizes but most of them are higher than they are wide. If you take your drawing board off the desk and turn it so the short sides come at the top and bottom, it will give you a drawing space just about the size and shape most often used in poster making. When you copy the posters, draw them big and use the whole board



each time. Then your copy will be like a real poster in size, and you will be getting a kind of practice that is very useful in drawing. People call it "enlarging" because the copy is larger than the thing you are copying. If you like you can plan to make the green board your background each time, and color in only the design of the poster. "Big Show" will look very well against the background of the drawing board. Some of the others, however, will have to have changes made in the color of the lettering and in some other places, to make the picture stand out. What changes would you need to make in "Come to the Fair"? Draw it with the dark background and see. The "Safety Day" auto can be made red or white when you come to that. You will find changing the colors to fit is not hard, after you once get the idea and begin to work it out.

Such changes in color would be hard to make if poster pictures were realistic pictures. But as you will quickly see when you come to think of it, poster pictures are always more or less conventionalized. Not one of them tries to show us the little details that a portrait or a photograph would show. Many have been made of cut paper, and all are painted or drawn in masses of solid color that could easily be copied in cut paper. Then they are arranged in a way that shows us the artist was more interested in making a good design, than in making his picture look real. When we have once noticed that, we will not be surprised



over the colors used in some of them—those in the circus tent, or the red eyes of the Teddy Bear and the yellow sail on the boat in the Toy Sale poster, for example. For you will remember that when an artist makes conventionalized pictures he does not have to follow the real color of a thing but has a right to use the colors that will serve his purpose best. Many people do not understand this. You often hear them joking, and sometimes complaining about the colors used in posters. Because they are not natural such people think they must be silly. Of course they are not always well chosen, for artists can make mistakes like everybody else. But just try copying the "Big Show" poster for instance and making the circus tent all white or brown as a real tent is likely to be. If you do, you will see in a minute that such a change, spoils the "postery" effect. By making a better picture—one that is more realistic, we make our poster fall short of its purpose. Its true purpose is to attract attention, and to tell its message as quickly and as forcefully as it can. The red and yellow tent does this far better than a white or brown one, for its striking colors "catch the eye" as we say, more quickly than the quiet colors.

Not only brightness but *contrast* in color helps the poster to do its work. The red and yellow tent attracts attention better because of the dark background against

which it is painted. You can easily prove this by painting the tent on a background of white or tan, and comparing it with the one on the dark background. That is why black is so often used as a background for posters, and why very good posters can be made entirely with black and white.

For a long time people thought that black and white used together must give the very strongest contrast possible, and they made a great many black and white posters, because they believed they would attract attention better, and could be seen more clearly at a distance than any other kind. But now we know this was a mistake. Other colors can be put together to make even stronger contrasts than black and white. People found this out by printing words in different colored letters on all sorts of backgrounds, and then making tests to see which could be read the farthest distance off.

In this way they proved that black letters on a yellow background could be read more easily than black letters on a white ground, and they made a list of colors that make the words stand out most clearly when they are used together. Here are the first six in their order:

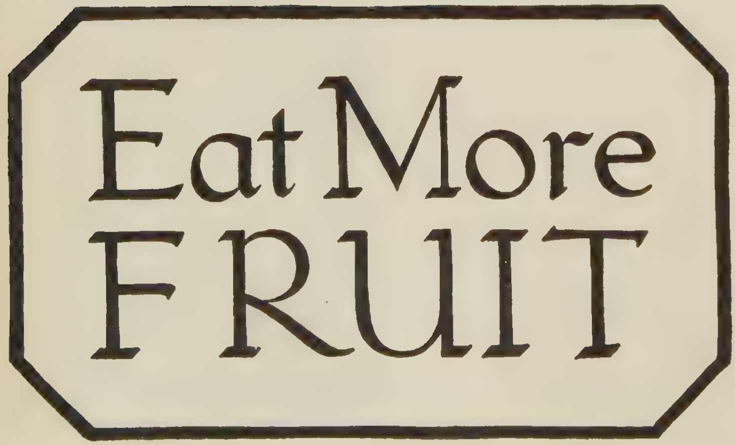
1 Black on yellow
2 Green on white
3 Red on white
4 Blue on white
5 White on blue
6 Black on white

So it seems that for the poster message at least, there are five ways of getting a color contrast that is stronger than black on white. This is very important for people who do advertising, and seems to prove that when colors "catch the eye" they do so, partly at least, because they are more easily seen, and not just because people like them better for being gay.

The wording of a poster is very important. As you know it is possible to make a good one without using any picture at all. Two word posters on this page and the next, will probably remind you of others you have seen, where the whole space is taken up by the wording. In such posters it is very important to make each letter as perfect as we can, and to space them well. But the lettering of any poster needs to be carefully done. Chapter XIII will help you when you come to that part.

In choosing the wording, remember it is not only what you say but *how you say it*, that makes your poster a good one or a poor one.

That is one of the first things we have to learn about any kind of writing—story writing, letter writing, compositions, plays—whatever it may be. Writing the message for a poster is no exception, and it is one of the hardest kinds of writing if we do it well. Grown-up people who invent the clever messages on advertising posters and signs, work very hard at it, and get well



paid for their work too. They have learned to say the thing they need to say in the fewest possible words, and to choose the words that people find it hard to forget, no matter how busy or careless they may be.

Take the message "Stop! Look! Listen!" for example. We see that often on the signs at railroad crossings. There was a time when those signs used to say "Railroad Crossing! Look out for the Locomotive!" But somebody thought out a better way of saying the same thing. "Stop! Look! Listen!" is a far better message for a sign of that kind. It is short, so short it can be read at a glance. Yet, short as it is, it says more. It tells you not only to look out for the locomotive, but how to look out for it. Then the sharpness of the three orders coming one right after the other, each in a single word, make the message forceful. That is the way people really speak, when they mean to keep you from doing something dangerous or wrong.

You can easily see why the message of a poster needs to be short, why it needs to be direct and clear. It is not so easy always to explain why one set of words should be more likely to make people act than another, but we can all feel the difference when we compare a well chosen message with a poor one. On page 154 and 155 page, for example, there are two posters with the words "Play Fair" on them. They might have said, "Keep the Rules," but you know at once when

you compare the two messages, that "Play Fair" is much the better one to use.

How about the wording of the middle poster on the Source Picture? As you see it says "Safety Day" but it might have said "Safety First," which is the motto for Safety Day, the "Slogan" as many people call it. Which seems to you to be the better message, the one most likely to make people act in the spirit of the day? I think you will agree that "Safety First" is much more direct and forceful, in fact it would be hard to improve on it, and you will probably decide to use those words on your own safety poster when you make one.

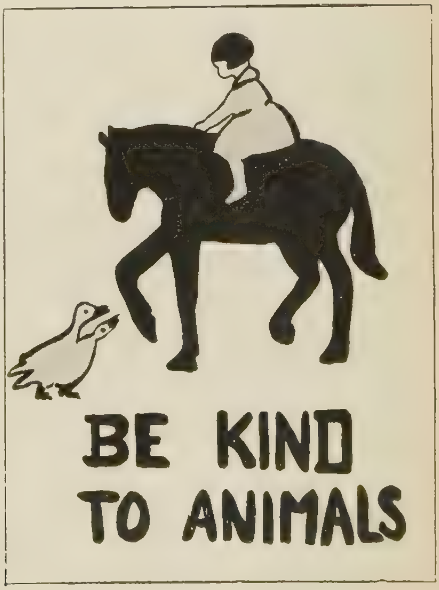
And now look and see what Santa Claus has to say to us in the poster on page 166. He says, "*You* buy a Tag!" and the picture helps him to say it by pointing his finger right at the person who looks his way. The poster might have said "Tag Day" or "Buy a Tag", but whoever made it knew there was a more forceful way of wording the message.

Of course Santa Claus wants you to help somebody who needs help very much indeed. He would not use a message of that kind if he were just inviting you to a Christmas party. We do not always need a slogan like "Safety First" or a command like "Stop! Look! Listen!" on our posters, and if we should put "You" in big letters on very many of them, it would soon grow tiresome. The message must always fit the purpose

of the poster. If we are just telling about something pleasant, like a flower show, or a birthday party, it will be less important to think out new and forceful ways of saying what we need to say. We can rely more on the picture to interest people and attract their attention.

When you make a poster, try to plan the words in such a way that they will be just as much a part of it as the picture. Do not let them look as if you had drawn a picture and then "tacked on" the message, or as if you had printed the message and then added a picture. Picture and words ought to seem necessary to each other. They should help each other tell the story. The Santa Claus poster is a fine example. So is "Bedtime Story" on the Source Picture and the one on page 162 called "Flower Show". Do you see how the artist who made "Flower Show" arranged her words? Her message is a real part of her design. Until you copy her poster you will hardly understand how carefully she planned it, and how cleverly. Some posters have part of the message above, and part below the picture. "Share Your Toys" is a good example, and so is the "Play Fair" poster with the picture of children in a play ground.

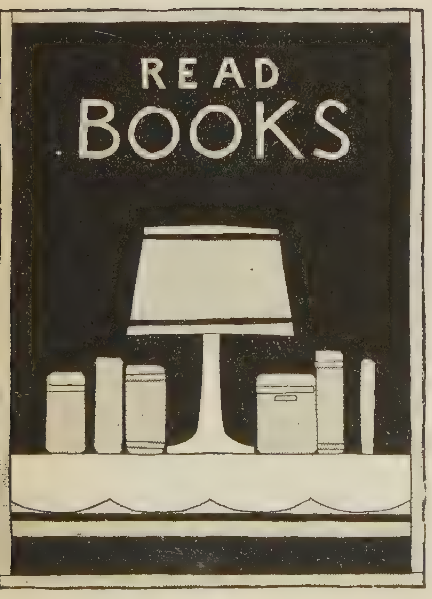
The girl whose poster says, "Be Kind to Animals" might have done the same thing. She might have arranged her letters a little more carefully, too, and



kept the spaces between the words more nearly equal. But her poster is a good one in spite of that. It is so simple and striking. Only three colors were used to make it, the gray background, black, and the orange used for the little girl's dress and the bills, eyes, and feet of the inquiring ducks down in the corner.

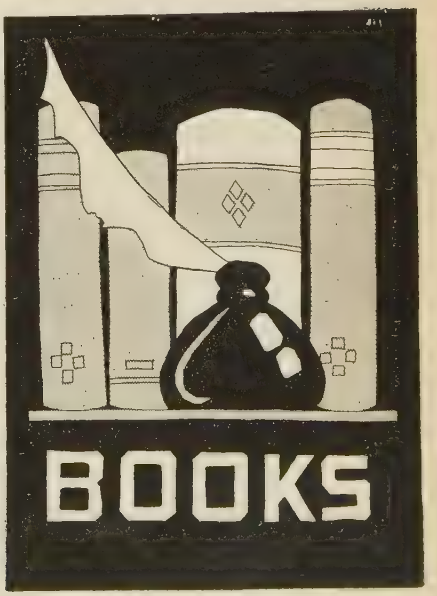
In making any picture our design or plan is supposed to fill the whole space we may have for it, and it must fill it in such a way that no part will seem crowded and no part will seem empty. That is what people mean when they say the design "balances." The design of a poster must balance like that of any other picture. When you have made one, look at it with this in mind and ask yourself whether it "balances". In some of these sample posters you will see that the artist has balanced the design by putting things of the same kind, the same number, the same size in just the same positions on both sides of the space he had to use. When we make realistic pictures we generally try to keep from doing that, but in conventionalized pictures it is very often done. Notice the candles on the birthday cake and the flowers in "Flower Show." Do you see any other posters where the design is balanced in that way? What about the scallops on the table cloth in the book poster with the lamp?

It is interesting to compare the two book posters. The artists who made them had almost the same idea



in mind, yet their posters are very different. Does it seem to you that one perhaps is a better picture and one a better poster than the other, and can you tell why?

What about the fourth poster on the Source Picture, the one that says "Bedtime Stories"? Can you imagine why such a poster should be made, or where it could be used for a real purpose? It could be used to advertise a story book, perhaps, or a set of phonograph records, for many people like to listen to stories on a phonograph. It seems hard to imagine why anyone should make a poster to call attention to the bedtime stories that people tell over the radio, or how it could help the people who run the radio stations, or the people who tell the stories. There must be another reason why the most important place on this poster is given to the picture of a radio horn, the same reason that made the artist put in a lighted candle. Nowadays very few people go to bed by candle light, yet in spite of that the picture of a lighted candle means bedtime to all of us. For in old days everybody went to bed by candle light, and so the candle came to be a *symbol* of bed time. In the same way the radio horn is used as a symbol, a symbol of listening to something, or perhaps we should say of telling something. The candle and the horn together help each other very nicely. Together they make clear the idea that was in the



artist's mind, the idea of the bedtime story.

The "Big Show" poster makes use of a symbol too. Any picture of a tent shaped like that one means "Circus" to almost anybody who may see it. For that reason it is not necessary to use the word circus on the poster at all. The words "Big Show" add a good deal, however, for they assure us that this is a circus worth seeing.

The posters on page 156 and page 157 were drawn by children ten and eleven years old. Each has the figure of just one child on it. It is often a good plan to do that—use just one figure to tell the story. That keeps the poster simple. The single figure of the girl running at top speed serves just as well to show what the artist had in mind, as if a crowd of children had been put in the picture. On the other hand "Play Fair" seems to need at least two children, if it is to tell its story.

CHAPTER XIII

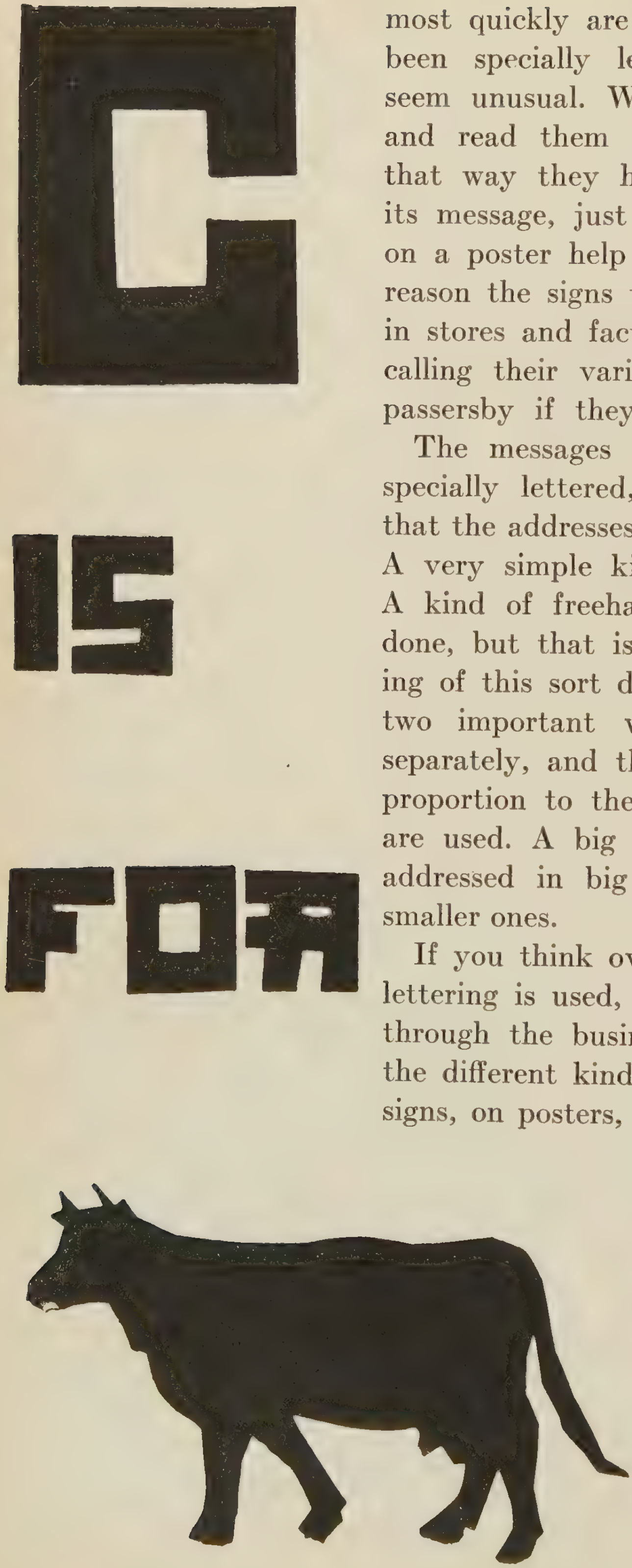
Lettering

When we write the message on a poster, we generally letter it. That is, we make special letters for it, and do not try to use our regular handwriting. We do this first of all because the words of a poster need to be very large and clear, so they can be easily read at a distance. Then they must be drawn or printed in such a way that they will be "showy," and help the poster to do its work by attracting attention. In addition they should fit in with the general idea and plan of the poster, and seem to be a real part of it. For all these reasons we need to make a careful choice of the letters to be used on a poster at the time we plan it. Often we have to invent special letters for it, and the size of the letters must always be carefully chosen to fit the spaces that we have to fill. Printers always have big letters among the different kinds of type that they use, "display type" they call it, and if we have a poster printed, we can sometimes use their display letters for it, but even the printer cannot always help us out with a picture poster.

The same thing is true of the display letters used for the advertisements that we see in newspapers and magazines. Those that attract our attention most quickly are nearly always the ones that have been specially lettered. They are the ones that seem unusual. We pick them out from the others and read them because they "look different". In that way they help the advertisement to give us its message, just as the pictures and bright colors on a poster help to give its message. For the same reason the signs that are used in public places and in stores and factories are much more successful in calling their various messages to the attention of passersby if they can be specially lettered.

The messages on greeting cards, too, are often specially lettered, and you have probably noticed that the addresses on packages are generally lettered. A very simple kind of lettering is used for them. A kind of freehand lettering that can be quickly done, but that is plainer than handwriting. Lettering of this sort differs from handwriting in at least two important ways. All the letters are made separately, and they are made larger or smaller in proportion to the size of the space on which they are used. A big package, for example, is generally addressed in big letters, and a small package in smaller ones.

If you think over all the different ways in which lettering is used, or better still, if you take a walk through the business streets of a town and notice the different kinds of lettering that you will see on signs, on posters, in windows everywhere about you,

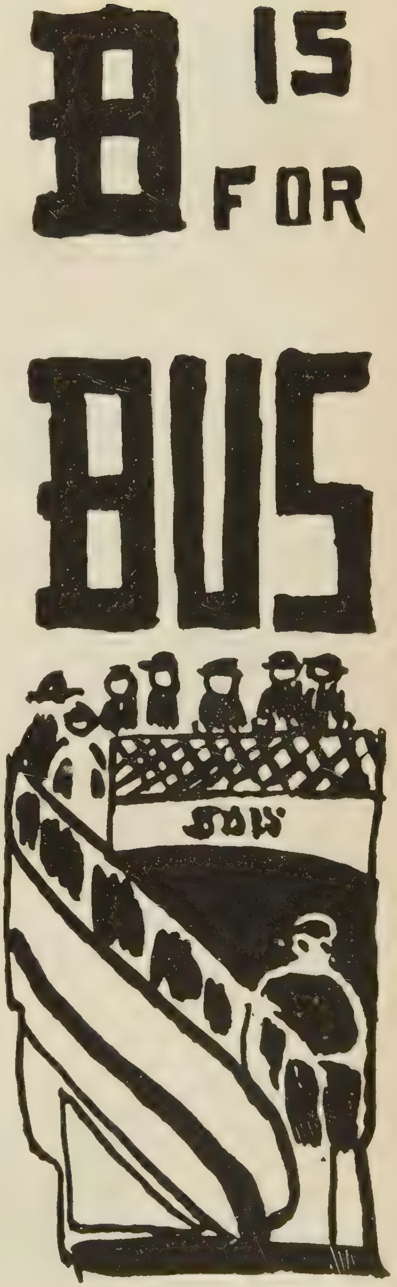


you will gain some idea of the great amount of it that has to be done constantly.

Every day in the year a great many people are busy lettering. Some people make it their special work and are well paid for doing it. Others find that to be able to letter well helps them very much with other work that they want to do. Engineers and architects, for instance, need to be able to letter well, and they make a special study of certain kinds of lettering. Anyone who keeps a store finds lettering a very important help to his or her business, and big stores often employ special people to letter the different signs and cards they need from day to day.

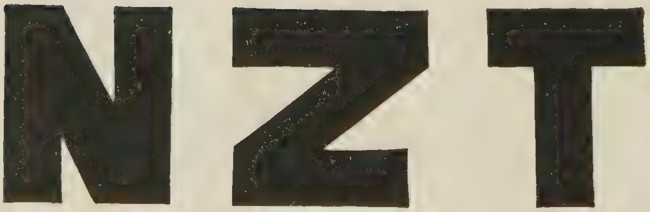
Every one of us ought to be able to do simple freehand lettering, if only for the sake of addressing the packages we may need to send through the post office. Nowadays when so many children make posters, and letter their own greeting cards, and the tickets that they use for the different entertainments that they give, at home and at school, very few of us can grow up without knowing something about it and finding out how many interesting ways there are in which lettering can be done.

On this page and on page 168 you will see some alphabet pictures that were made by two children who were just beginning to be interested in lettering. They had learned how to make the cut paper alphabet you see on the margins of pages 170, 171, 172 and

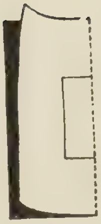


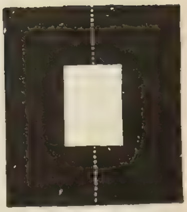
173. It is a very good one for a beginner. The capitals and small letters are made just alike for one thing. Then the letters are showy, and can be cut wider or narrower as you may need, to fit your space. That makes them especially convenient for poster work. You decide just how high you wish the capital letters to be, and cut a strip of paper just that width. Then, as you make each letter, you cut off a piece of your strip, an oblong, wide or narrow, according to the letter you are going to make. The small letters are cut in the same way from a narrower strip. The boy who made the picture of the cow cut his capital "C" from a strip of paper three inches wide, and his small letters from a strip one inch wide. After he had cut them out and pasted them down he colored them.

If you look carefully at the margins of this page and pages 171 and 172, you will see just how each letter in this cut-out alphabet is made. A piece of the paper strip cut straight across makes the "I." It can be made as wide as you choose, but all the other letters should be cut in proportion. So the width of your "I" tells you how wide to make the "L" when you come to make that from an oblong, cut off from your strip. "S," "Z," and "N" are all made from such oblongs. The pictures show you how to cut them.



The letters, “O,” “C,” and “G” are made by folding the oblong in half and cutting out the center.

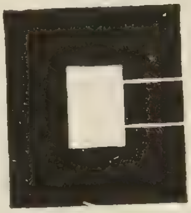




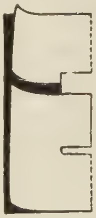
“U,” “J,” “H,” and “M” are made by folding the oblong in half, and cutting both sides of the letter alike. To make the “J,” cut “U” first, and then cut away part of the left side of it.

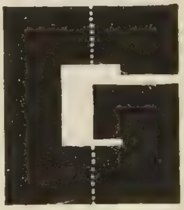
“A,” “V,” and “W” are made with the oblong folded line, the sides are slanted.

“Y” is generally cut on a fold too, and “T” can be cut in that way if you like. Some people cut “T” just as they cut “L,” right from the oblong without folding.



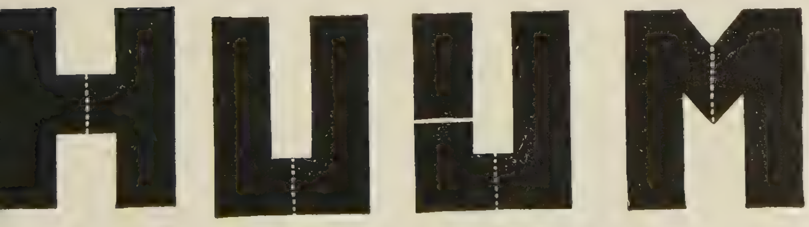
“E,” “F,” “K,” and “X” are often cut without folding too, or they can be cut, as you see, from the oblong folded in half from top to bottom. When “F” is cut in this way, an “E” is cut first, and the lower part cut away afterwards.

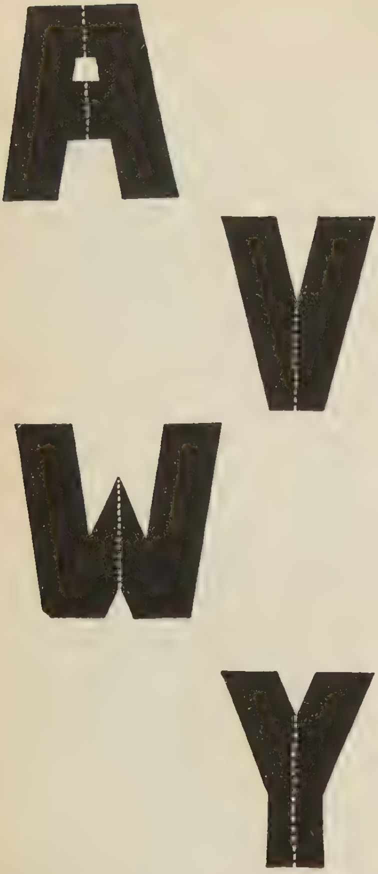




The letters “B,” “D,” “R,” and “P” have pieces cut away from the left side of the oblong in the way the pictures show. Then the oblong is folded, the right hand side being brought over just as far as this cut away edge. The centers are then cut out as you see. “Q” can be cut in the same way except that the cut away piece is taken from the right hand side.

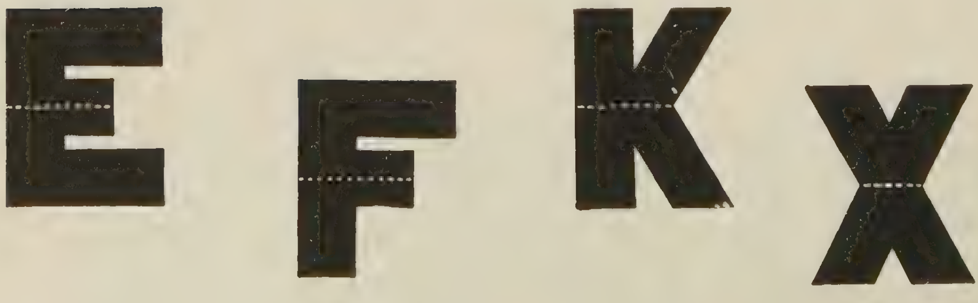
When you are using this alphabet you can sometimes begin by laying your paper strip down on the space you have to fill and cutting off a piece just





the right length for one line of your message. Then if you cut it into as many oblongs as you will have letters in that line, and cut away a little from each oblong to allow for the spaces between the letters, it will be quite easy to put your letters on evenly afterwards, and to get them all in. By drawing a very light pencil line with your ruler as a guide, you can keep the lower edges of the letters straight, then the tops will be even too, as they were all cut from a single strip, or from strips of the same width.

The spaces between the letters need to look the same in size, even if they are not exactly the same. It is a curious thing about lettering that we cannot space our letters correctly just by measuring. Two letters put side by side will often seem too near together or too far apart, when they are really just the same distance from each other. If you try putting "L" and "T" side by side on the same line and then put "H" and "M" side by side, you will see that this is so. If they are all put just the same distance apart, the space between the "L" and the "T" will look to be much larger than that between the "H" and the "M." So, as we paste them down, or draw them in, we must arrange our letters

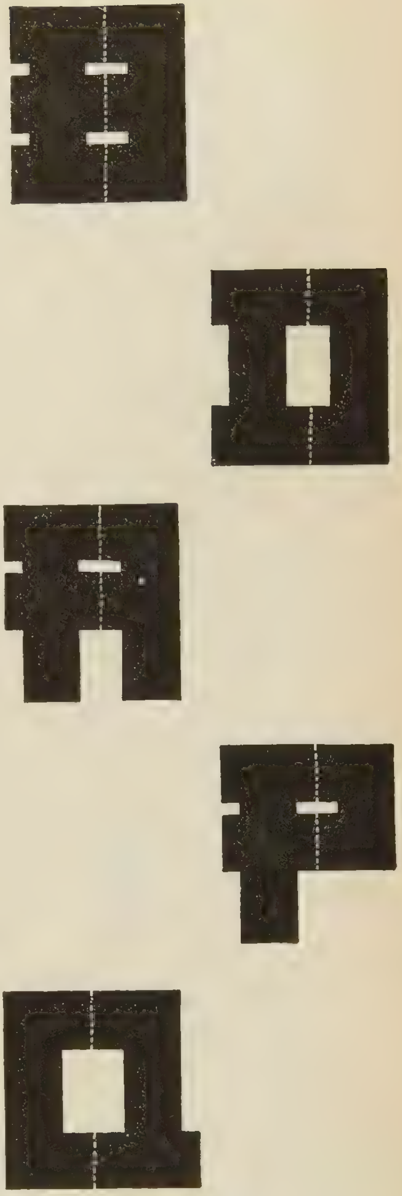


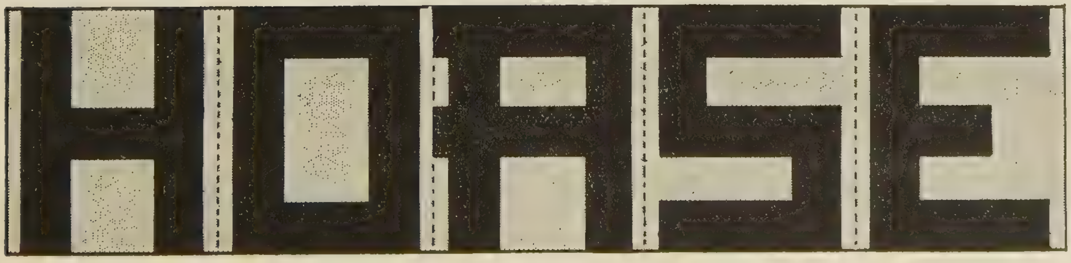
to *look* an even distance apart, and to do this we have to "trust to our eye" as people say, rather than our ruler. Just as the letters of each word ought to seem the same distance apart, the spaces between the words should all look to be the same.

Wide spacing and narrow spacing make a great difference in the appearance of a word. We can make the same message look very differently as we may use heavy letters with narrow spaces between them, or letters drawn in light lines with wide spaces between them.

The lettering of the second alphabet picture, the one on page 169, has been done with a brush, freehand. Some of the sample posters in Chapter XII have been lettered in the same way. As you look at them, you can see that guide lines were used at both the top and bottom of the letters. These light pencil lines can be easily erased afterwards and everyone who does careful lettering uses them. On pages 178 and 179, you will find an alphabet that is especially good to use when you need to make big letters and want to draw them freehand with your brush.

Letters can also be drawn freehand with sticks cut





and sharpened like those in the pictures on this page. You can use your Hy-San Paints with them, or ink as you prefer. One way to do is to sharpen the stick as you would sharpen a pencil, then rub the point on a piece of sandpaper until you have a round smooth end that will make a broad line when you dip it into color, or ink. Another way is to make a flat "nib" on your stick and use it as if it were a broad edged pen. Sticks of this kind are useful for smaller lettering. You can letter greeting cards and the addresses on packages very nicely with them.

The alphabet on this page and page 175 is a good one to use for freehand letters of that kind, and the names on some of the Source Pictures of the Scroll, those under the pictures of "Things the Children Use," and "What the Children Wear," for instance, can be easily copied freehand.

This is an especially good alphabet to practice with crayon on your drawing board. Do not use guide lines but learn to make the simple letter forms quickly and in long straight rows. That is a real accomplishment and a very useful one. The drawing board will help you tremendously to acquire it.

The two children who drew the alphabet pictures "C is for Cow," and "B is for Bus" were making

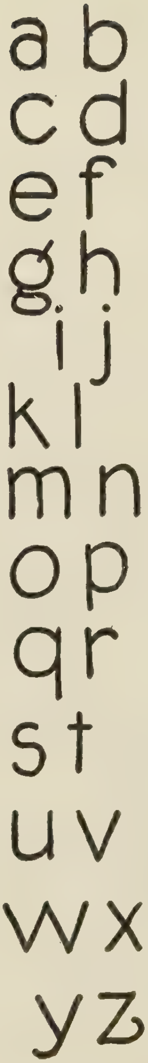
A B C D E F G

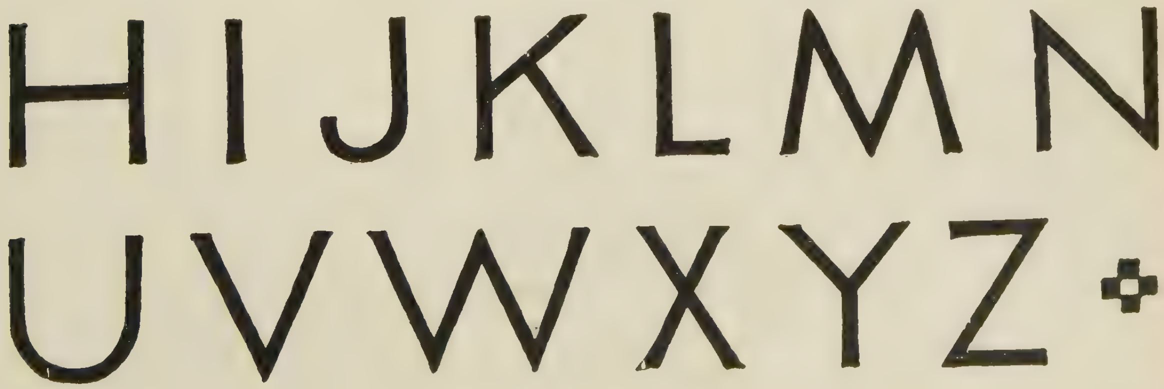
O P Q R S T

alphabet books to give as presents to younger brothers or sisters. I suppose they thought, as many grown-up people still think, that if a little child has learned his alphabet it will help him learn to read. But in most American Schools nowadays, children are not taught the alphabet until they have learned quite a little about reading. They begin by learning little sentences and words from the very first day they begin reading lessons in school. Each word when it is printed or lettered makes a pattern of its own, and they learn to know it by its pattern and not by looking at the separate letters that make up the pattern. So if you want to help your little brother or sister learn to read, and really make it easier for them when they begin school, do not make an alphabet book,—make a picture book and put the name of each thing very plainly underneath its picture. Alphabet books are great fun to make, but you had better make those for your own amusement.

It is a good idea to make the pages of a little child's picture book out of some kind of cheap, strong cloth, and paste in cut-outs and cut-out letters in gay colors.

Another good present to make for anyone who is just learning to read is a lotto game. Take a piece of




H I J K L M N
U V W X Y Z

CHAIR

BED

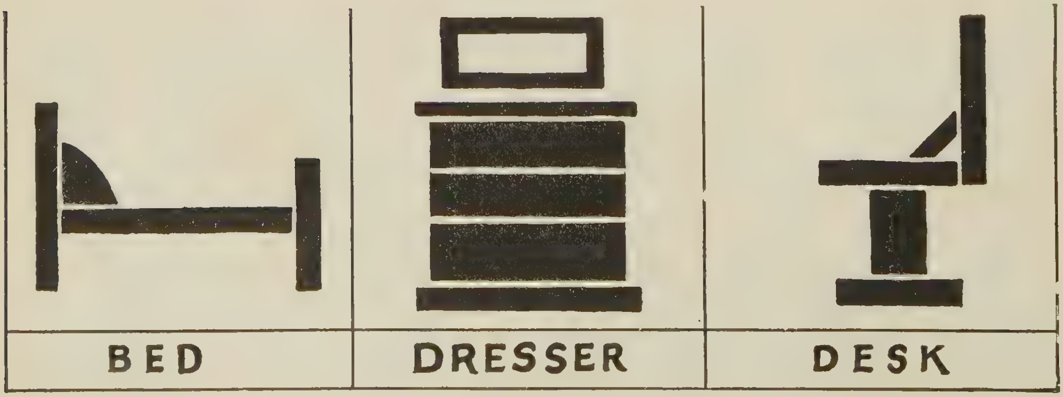
TABLE

DRESSER

LAMP

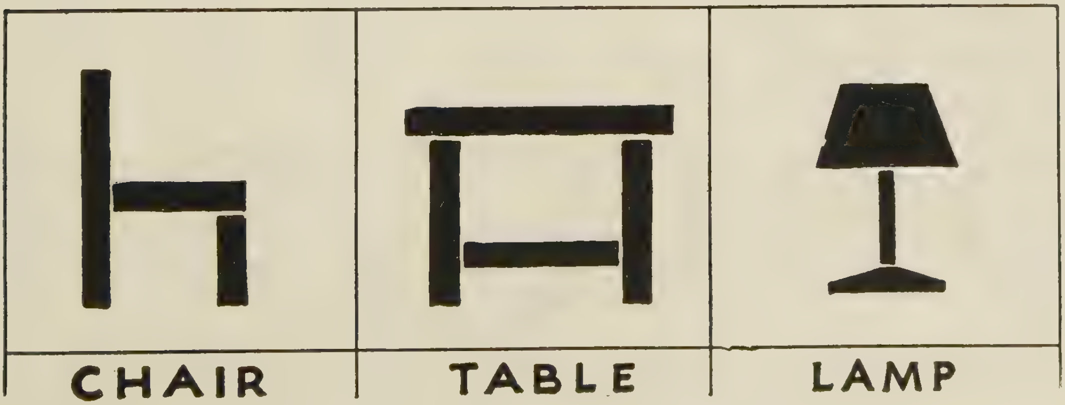
DESK

stiff paper or light weight cardboard and measure it off into spaces. Put a picture in each space and letter its name very plainly under it. Then make name slips that can be matched to the names under the pictures. On the back of the lotto card paste an envelope to hold these name slips when you are not using them. All the names should be lettered. When you play the game, each child uses one card at a time and begins by taking the little slips out of the envelope on the back. He picks them up one by one and matches them to the names printed under the pictures. When he has matched them all, someone who can read well looks to see if he has made any mistakes. If not, he puts the slips back in their envelope, and takes another card. A player loses one point for every mistake he makes in matching. As you see two or three children can play the game together, or one can play it alone. It is interesting either way, and either way it is possible to roll up quite a score. The matching should be done quickly and with lots of snap. Just as soon as a card has been "matched up" the score should be counted and any mistakes corrected. Then the player puts the little name slips back in their envelopes, takes a new card, and begins matching the names on that one. So the child who is "pokey"



and does not keep his mind on the game while he is playing will easily be beaten. It is a fact that to be quick when you play lotto helps you to play it, if only you are careful as well as quick. For a good game you should make at least six cards. Twelve cards make a better game, and of course you can have as many as you care to make, but a little child who is just beginning to learn the word pictures should be given only one or two cards to play with at first.

Generally the six pictures on a card are chosen because they are alike in some way. The "Things the Children Eat," the "Things the Children Wear," or that they use for traveling or as playthings can be used together to make up a card. Pet animals, or wild animals, or farm animals, or birds can be put together on the same card, and so you see the Source Pictures can help you to make up lotto cards, if you find it hard to think of pictures to use for them. After you have learned to match the slips very easily, try making the game harder by pasting a strip of paper over each name on the big card. If the strip is pasted down at one end only, it can be lifted up again at any time to remind a child of the way the name looks. When the game is played in this second way the name strips are matched to the pictures just by remembering them.



A still harder way of playing lotto is to use two or three cards at once and mix the little slips all together. Then instead of choosing the right word from a set of six slips, you will have to choose it from a larger number. Many children have been greatly helped by playing lotto when they were learning to read. And older children sometimes find it a good plan to make up cards with long hard names on them, and test themselves on such words as "antimacassar," "rhinoceros," "hippogriff," "incinerator," "salamander," "sarcophagus," "thermometer," "vinaigrette," and others equally long.

The letters of our alphabet were invented about 2,000 years ago, but printing is an invention only about 500 years old. Before people began to print, books all had to be lettered by hand. That made them very scarce and very costly. But very beautiful lettering was done in those days because, as you can imagine, people had a great deal of practice at it. The men who made most of the books that were used were monks who spent nearly all their time in that way. Sometimes they were called "copyists." After trying a great many different kinds of lettering the "copyists" came at last to use the alphabet that you will see on Source Picture Number 13. The letters in the first two rows show you how they

ABCDEFG

OPQRST

made their capitals, and their numbers. The third row shows you what their small letters were like. Today they are often spoken of as "Script" or "Broad-edged" letters,—the second name being given them because they were made with a broad pointed pen. They are like printed letters in form but they suggest handwriting too. Like printed letters, they are clear and easy to read. At the same time, they are easy to make, and can be made very quickly by anyone who has practiced them.

The broad pointed pens used by the men who copied books and wrote all their letters and business papers in this kind of writing, were made from quills, generally from goose quills. They cut the points on them for themselves just as you and I sharpen our own pencils today, and they used a small sharp knife when they did it. That they named a "penknife." So you see a penknife is not a modern invention and has quite a little history of its own.

Today when people have metal pens to write with, very few ever try to use a quill, or to sharpen one for themselves. But most of our metal pens have points too fine to do this kind of writing. So if you are anxious to use some of these beautiful old script letters for a poster or a greeting card, you

HIJKLMN
UVWXYZ

will need to buy a special kind of pen point or invent something to take its place.

On the Source Picture and on the margin of this page are pictures of some of the broad edged pens that are sold in art stores and by some stationers especially for lettering, and that can be used for making the script letters. The pens that are known as "the Hunt pen" and the "Soenicken pen" are the best ones to ask for. A carpenter's pencil is a very good thing to use. This can always be bought at a hardware store. It has a very wide lead that can be sharpened to a flat, broad point, as the picture on page 181 shows. With such a pencil you can easily do the script lettering, erase any mistakes you may make and then, if you like, color or ink in your lettering afterwards. You may want to try a quill pen too, and cut the point for yourself as they did in old days. It is not easy to make a good one, but you can learn to do it if you can get the quill. A good substitute can be made from a small bamboo reed, such as comes at the top of a fishing pole. You can shape this with a knife in the way the picture shows. Make a little hole in the top so the ink will flow, and bind a thread or elastic about the top to keep the reed from splitting above the hole. Artists often think a good bamboo pen better than the specially made metal pens that one has to buy.

In some schools today children are taught to use this old fashioned script for hand writing. Many children find they can learn it more easily than the usual copy-book handwriting, and they can read it more easily, too, because it is so much more like printing. After they have practiced it,—for of course one needs to practice any kind of handwriting,—they can write it just as quickly, often more quickly than the copybook handwriting, and other people can read their writing better because it is so clear. If you are one of the children who has trouble with the ordinary writing that the copy-books teach, you may find you can improve your penmanship very much by using this old fashioned alphabet. In England, where some schools have taught it for a number of years, business houses are anxious to employ people who can use it. Some firms make up special classes to teach the grown-up people who work for them how to write in this way. In America, a few schools have begun to teach it as handwriting, but it is used a great deal for lettering. The funny little

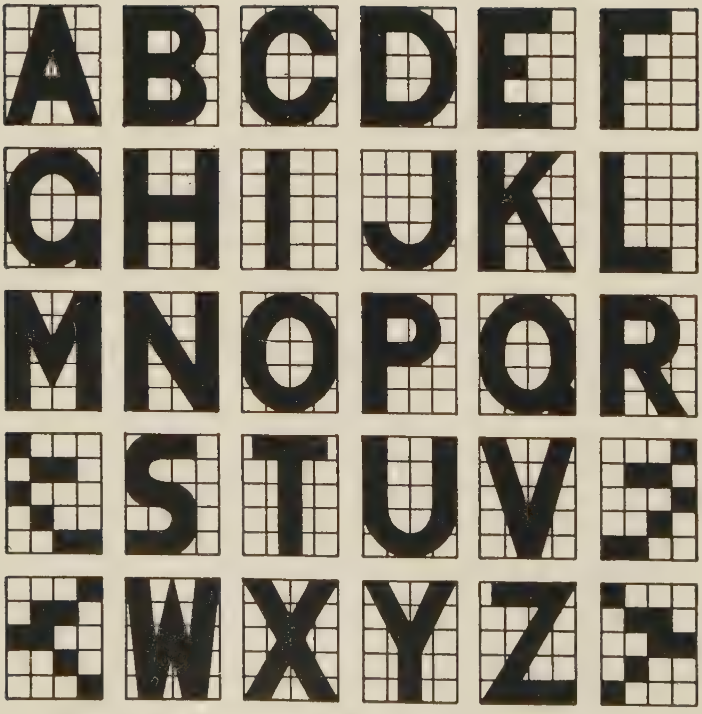
flourishes are called "serifs" and are great fun to make. Here is a quotation lettered in script letters.

Do thy little well
And for thy comfort know
Great men can do their greatest work
No better than just so.

The most careful kind of lettering, and quite the hardest kind anyone can do, is that done by the people who invent patterns for the type that printers use. A man who does that kind of lettering is called a "typographer." Did you ever stop to think about the type a printer uses? Where it comes from? Who first planned it? I suppose the great majority of girls and boys think of the letters they see every day in books and newspapers as things that "jes growed," like Topsy in the story. But every one of the different alphabets or "fonts," as the printer calls them, had to be designed and drawn first of all by hand. Little and big, they were once lettered by somebody, the best of them by people who think of letters as we think of units for a design. A fine typographer is an artist at his kind of work. He invents letters that will fit together in word patterns that are beautiful and pleasing to the eye. He draws his designs in large size and very carefully no matter how small the type that may be made from them afterwards.

Aldus of Venice, one of the first great printers, William Caxton, the first great English printer, William H. Caslon, also an Englishman, Simon Fournier, a Frenchman, the Italians Garamond and Bodoni, Frederick Goudy, and Bruce Rogers, the Americans, are all men who have made famous names for themselves because of the type that they designed. Their letter units have been used by printers all over the world and millions of people have enjoyed their beauty.

But of course, long before anyone can design letters perfect enough to be used as printers' type, they must practice lettering of a more careful kind than the different alphabets for beginners that we have been describing in this chapter. The first step in making more carefully drawn alphabets is to draw them on squared paper. The third alphabet on the Source Picture was drawn in this way. The pictures on next page show how the squared paper is used to make the letters as even and perfect as possible. The lines making the squares are very light pencil lines. They are carefully measured and drawn with a ruler. Then each letter is drawn in pencil first, and colored or inked in afterwards. When they are dry, the light guide lines are erased. The squares used will be larger or smaller according to the size and style of the letters. Stationers often sell pads of squared paper that can be used for practicing this kind of lettering, but the blue lines on it cannot be erased, so it is really better to "square" one's own paper. As you will notice some letters are three squares wide, some four, and the letter "I" is only one square wide. As we found in the cut paper alphabet the width of the "I" gives us a measure for all the rest of the letters.



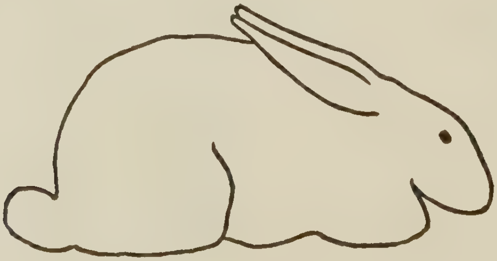
CHAPTER XIV

The Children's Pets

How do you draw pictures of animals? Do you draw them "out of your head" as people say? Do you look at the real animal and try to make what artists call a direct drawing? Or do you, perhaps, copy pictures that other people have drawn? I suppose every good animal artist has drawn animals in all three of those ways, and has learned something about improving his drawings from each one of them. Drawing animals is one of the very hardest kinds of drawing. Indeed, it is perhaps the very hardest of all, next to making portraits of people.

When children are little they always begin by drawing things out of their heads. That is, they draw them from memory, and drawings of that kind are very important, because they test our memories and show us better than almost anything else can show us, just how much or how little we really know about an animal or an object. Take your white crayon and try to draw an animal of any kind on your drawing board. If you draw him out of your head you will see just what I mean, especially if you choose one that you have not yet practiced drawing. Suppose you should try a rabbit. The very first rabbit that you draw, no doubt, will have long ears and a little round tail, because those are the things that everyone notices at once about a rabbit. But you will probably need to draw him again and again, and to take a good look at a rabbit or at a picture of one between times, before you get the real rabbit shape with his head and body about the right size for each other, and his legs the right length, and in the right positions.

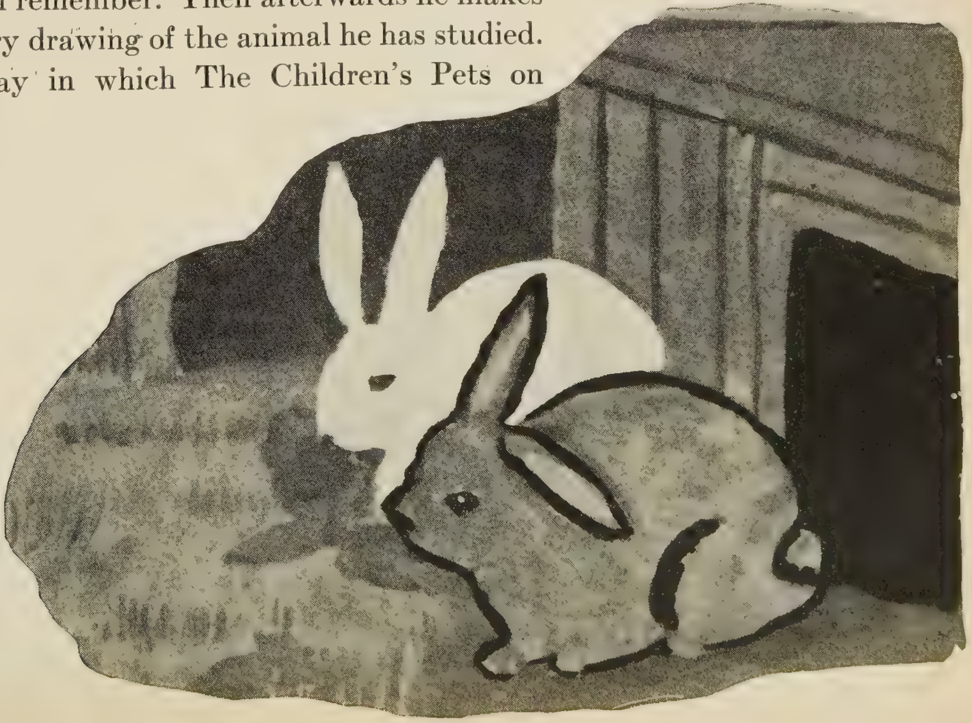
The things we draw out of our heads need to be things that we see often, if we want our drawings to improve. For then, each time we draw them we test our memories, and when we see them afterwards we can observe them more carefully, because our own pictures will have shown us that we need to learn more about the way they look. Sometimes people think children do not learn anything by drawing out of their heads, but that is a great mistake. It is one of the very best ways to learn to draw, and it gives us a great deal of information besides. If we keep trying to improve our drawings, and observe carefully the different animals and objects themselves between times, then the oftener we draw them, the clearer our memory of them will be, and the better the pictures we will be able to make. The boy or girl who can draw the best rabbit, like the boy or girl who can draw the best auto or the best locomotive,



is the one who has drawn ever and ever so many of them and looked at them, or at their pictures, a great many times.

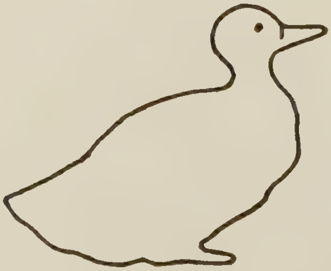
Great artists often do most of their work from memory, but not all of it. Sometimes they help their memories by drawing from a model. Do you know what that means? When a beautiful child sits in a swing and an artist draws her, she is his model. When you hear people speak of an artist's model, they usually mean a person, but artists draw animals and all sorts of objects in the same way, by looking at them and drawing them very carefully without trusting to their memories at all. They call this making a "direct drawing," and it helps them to be careful and accurate. It helps them, too, to draw better pictures from memory afterwards.

But it is not easy to make a "direct drawing" of an animal. Unless they happen to be sleeping, animals seldom keep still very long. They have no idea of "posing" for us, and the animal artist has to do very quick work when he is making direct drawings. He generally does ever so many little "sketches" as he calls them—unfinished drawings, just a few lines each time to help him remember. Then afterwards he makes a careful memory drawing of the animal he has studied. That is the way in which The Children's Pets on



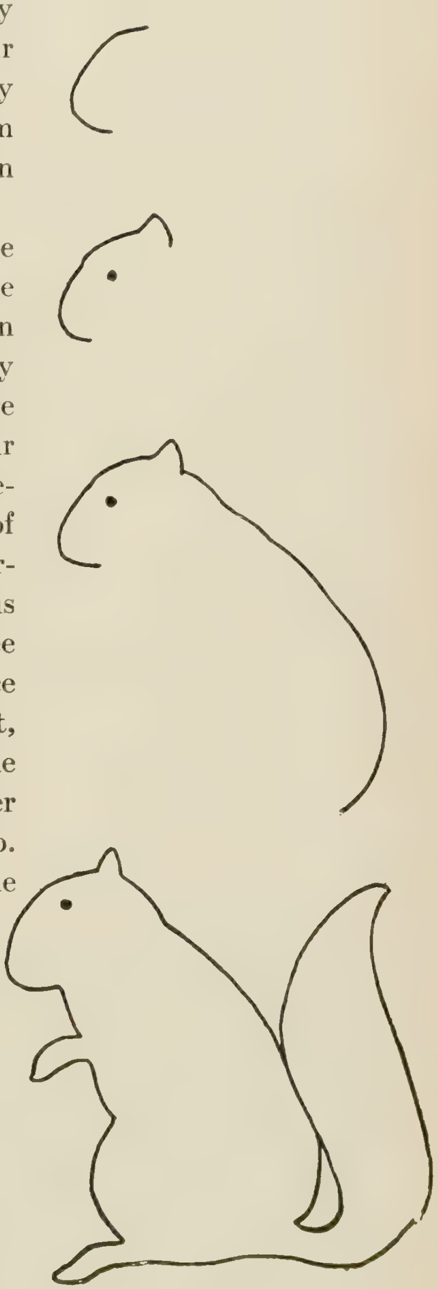
Source Picture Number 14 of your Scroll had their portraits taken. Miss Cleaveland, the artist who drew them, makes hundreds of direct sketches every year. She draws her own pet animals over and over again, and all the birds and squirrels and other animal visitors that come into her garden. Often she pays visits to the farmers to draw the farmyard animals, and sometimes she goes to the Zoo and sketches the animals she sees there. She studies pictures of animals, too, both their photographs and those that other artists have drawn. As you see, she shows us only the important things about each one, but those are the things most necessary for us to know and to remember, and looking at pictures like hers will help us when we come to draw out of our heads, in much the same way that we are helped by looking at the animals themselves.

They are good pictures to copy for the same reason. Copying a picture, like making a direct drawing, helps us to be careful and accurate. As children grow older they find they can improve their pictures by making direct drawings and by copying, and because copying is by far the easier thing to do, many children do a great deal too much of it. Copying should always be thought of as a help, and not as an end in itself. When children, or grown-up people for that matter, copy for the sake of making copies, and not just to learn how to improve their own drawings, they soon



stop learning. They lose the habit of seeing things for themselves, and drawing them in all sorts of new positions, and new ways. A copied picture may look more finished, more like a grown-up person's picture than the pictures we draw for ourselves, but it is by making "original" pictures, pictures that are really our own, that we learn the most about drawing. Our own pictures show us, too, just how well we really know how to draw. This is true whether we draw them out of our heads, or make direct drawings from an object or model.

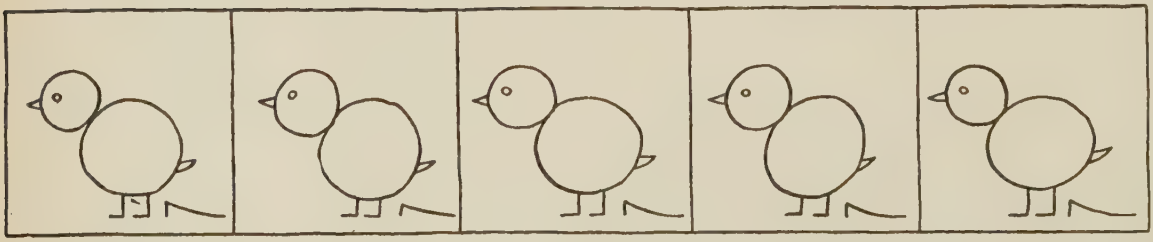
Then it is nearly always true that a drawing done by someone else never exactly fits into the place where we wish to use ours, and of course, if it is a question of making pictures of our own pets, we can hardly expect that copying the animals on the Source Picture will help very far. Whatever we do to improve our drawing of these particular animals ought to be something that is going to help us with all the pictures of cats, puppies, ducklings, rabbits, chickens and squirrels that we may try to draw, and that will help us draw them in different positions, not just as we see them here. For this reason it is a good plan to practice turning each one of them around when you copy it, and make it face the other way, just as you drew the Story Book Children and made them face the other way when you were working with Source Picture No. 7. You will find it is fine practice to do this, and the

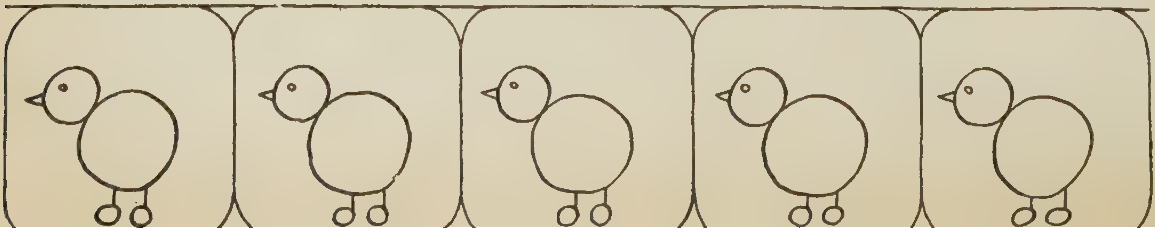


models on the Source Picture will be just so much more useful to you, if you can learn to draw them in both ways.

One of the first things we need to learn in drawing an animal, whether we copy from another picture, try to sketch the live animal itself, or just draw it out of our heads from memory, we will find it a good plan to begin always with the most important lines. If you look at the pictures of the Children's Pets, you will see very quickly that they are the lines of the back and head each time, and that these big lines, once you have drawn them in, give you an idea of where to put in all the others. When you have drawn the lines that give you the head and back, then you can finish up the head,—putting in the ears and eyes and the mouth, or the bill, as the case may be,—and then go on and finish up the body, drawing the line underneath, and adding the legs and paws or feet. Last of all add the little extra lines that show the wings or curves of the body like the shoulder of a cat.

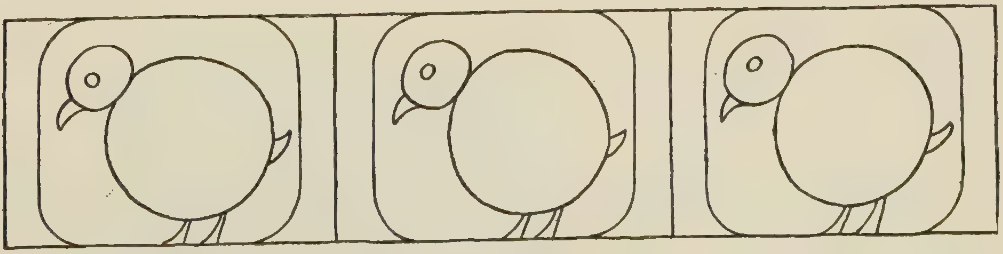
But there is another way to use these pictures, one that many people have found very helpful when they were learning to draw. It is a combination of drawing out of one's head and copying. People have named it "memory drawing." So when you hear anyone speak of "memory drawing" today, it is probable that they mean this kind of practice or something very much like it. You begin first of all by making a draw-

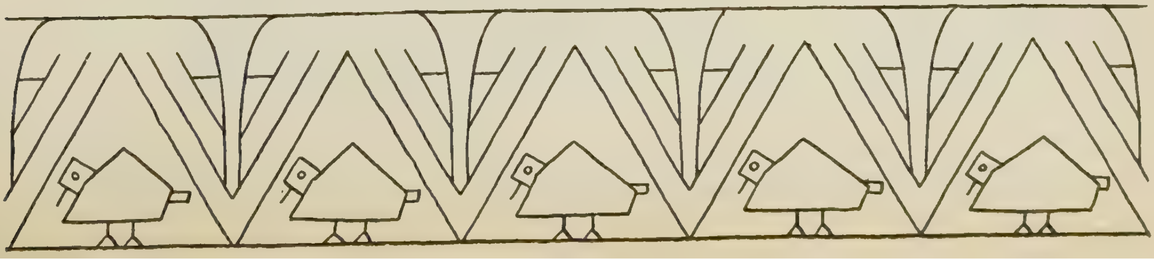




ing from memory. Then you compare it with a model or a copy. Take the squirrel, for instance. Without looking at your Source Picture, take your crayon and draw quickly the very best squirrel you can, out of your head. Then compare him with the squirrel on the Source Picture and see what that can show you about your own drawing and the details you may have remembered or forgotten as you drew it. You will notice how small the squirrel's ears really are, perhaps, or how much shorter his forelegs are than his hind legs, and that his tail is really quite as long as all the rest of him put together. So now if you make a copy of the Source Picture, it will help to fix these points in your memory. And that is the very thing you do. You erase your own picture and make a careful copy of master squirrel from the Source Picture, and when you have finished that, you erase it and draw a picture of your own again,—another picture from memory. The second memory picture is nearly always better than the first one, and the improvement that you make by this kind of practice generally lasts, and helps you with all the squirrels you may try to draw afterwards.

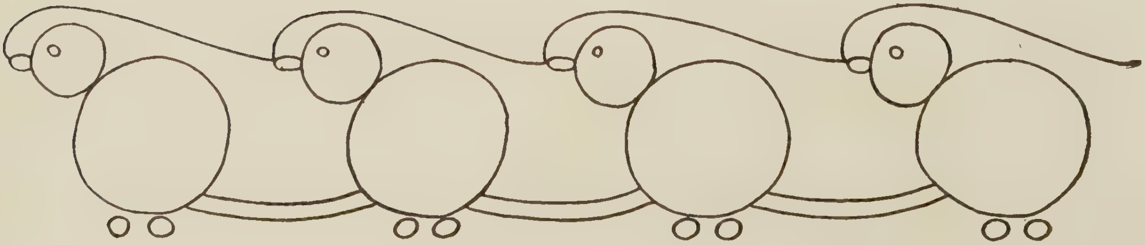
One of the things that help us most to make a good drawing of any animal, is to keep his special characteristic in mind all the time that we are drawing him. What is there about a squirrel, for instance, that makes him look like a squirrel and not like a rabbit or

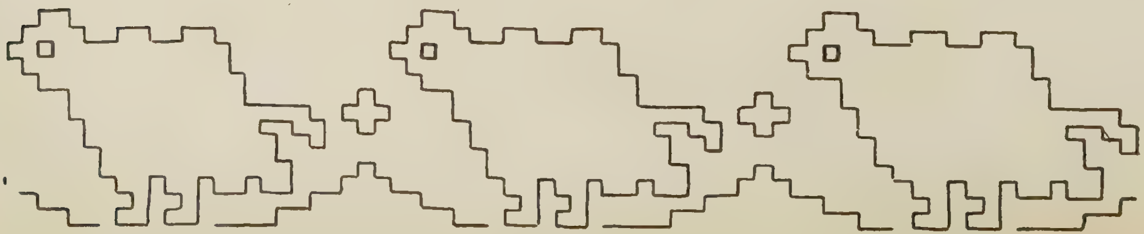




a puppy? We think right away of his big tail, of course, of the way he humps up his back, and holds a nut up to his mouth as we see him sitting on the lawn or on the branch of a tree. These are physical characteristics and they are important, but they do not tell the whole story. The thing that makes each animal different from every other animal is not entirely his size and shape, his coat of fur, his skin, or the way he is put together. Sometimes it is very hard to tell just what the characteristics are. The thing that makes the cat, cat-like, and the dog, dog-like, for example, lies in their minds and in their actions quite as much as in their physical makeup. Of the squirrel, we can say, perhaps, his chief characteristic is alertness. As he sits there cracking his nut, we know that never for a minute is he off his guard. If we make the slightest movement away he flies, up the trunk of the nearest tree, and into the branches far away from us. So even while he sits there eating his dinner, his muscles are all ready for a spring that will send him bounding away to safety, and his little, roving eyes are watchful every minute. "On guard" seems to be his motto. If we think of this as we draw him, it will help us. Our drawing will have a squirrel-like look that it will never have if we just think of him as a little brown animal with four feet and a furry tail.

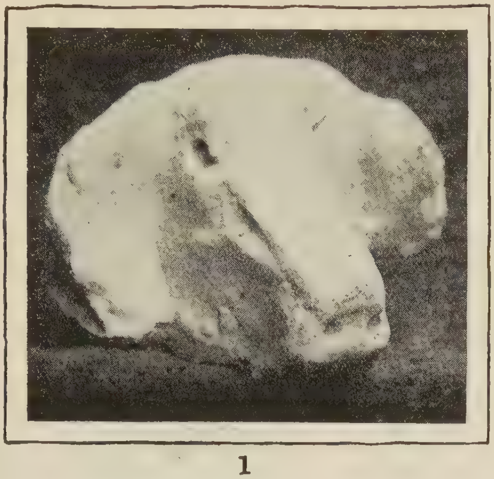
Take each one of the pets on the Source Picture and ask yourself what is the special characteristic of each





one. I think you would say the duckling is awkward, the puppy is playful, the rabbit is timid, the chick is self-confident, and the cat, well, the cat is "cat-like," and by this expression I think we mean that, although she may be a great pet, and loves her saucer of milk, and loves to be patted and stroked, still underneath all her friendliness and comfortableness, there is always a wildness about her. Her strong muscles are always ready for a crouching spring if a mouse or a bird come within smelling distance. Pussy hasn't forgotten, and never will forget, that she was once a wild animal, and got her living by being a great hunter. She still has the heart of her big, fierce cousins, the tiger and the lion, and when we draw her picture, we need to feel that spirit of wildness underneath the soft lines of her fur. If we do, our picture will have in it the thing that is her special characteristic, the "cat-ness" about her that is so hard to describe.

On this page, and on pages 194 and 195, you will see some pictures in clay that different children have made of their pets. Nearly all of them are pictures of dogs. They are made by children between six and nine years old. Perhaps you can do better, but it is hard to make good pictures in clay and these children did very well indeed for their ages. The figures were all modeled at school. So you see they were all pictures from memory that the children did out of their heads. One or two of the dogs are begging, and one



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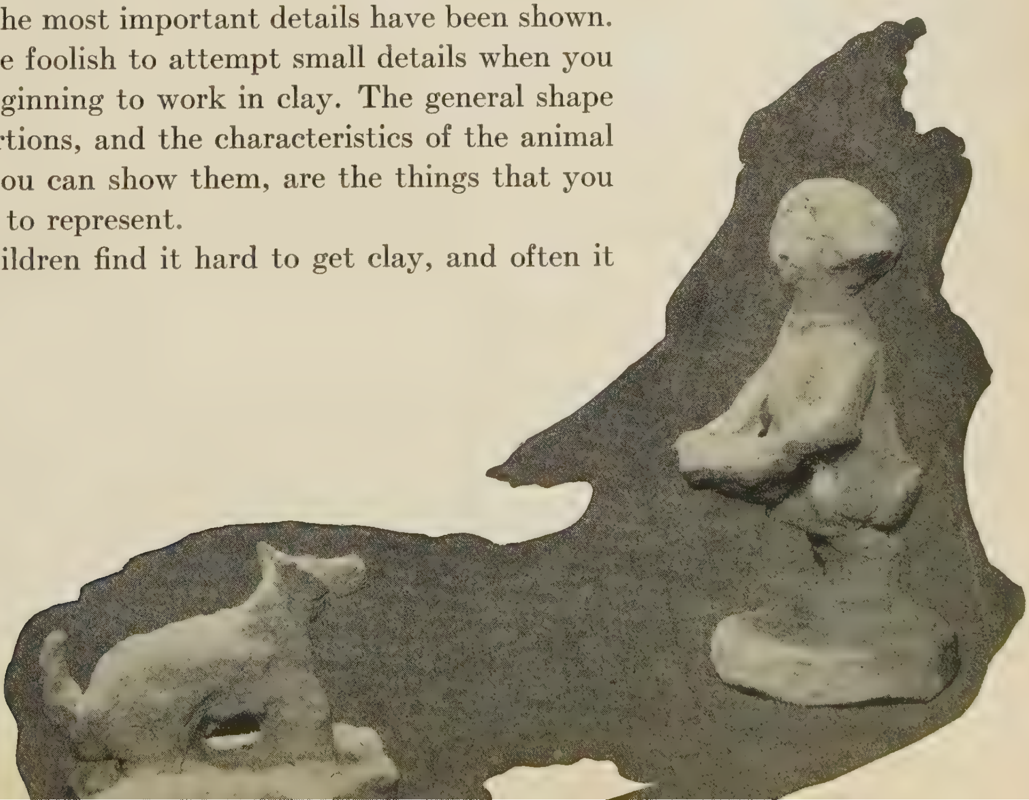
of the girls has made a picture of her cat lying stretched out on her side as cats love to lie when they are warm and comfortable. Another girl has made a picture of herself carrying her dog's dinner to him.

If you have clay to work with, be sure to try some portraits of this kind. If you work at home where you can see the animals themselves, you can do memory pictures in clay and have the same kind of practice with it that is described on page 191. Begin by modeling the animal out of your head, as you remember him. Then, when you have done the best you can, look at your pet, and make corrections in your clay figure as you look at him. Then begin all over again and make a second memory picture from a new piece of clay, or from the old one kneaded up into a shapeless mass again. The second clay figure will nearly always be much better than the first, and it is a capital plan when you have finished it to sit down at your drawing board, and make a quick memory drawing with your crayons, to fix in your mind the special details you may have learned by making the clay picture. You will notice in all these clay pictures that only the most important details have been shown. It would be foolish to attempt small details when you are just beginning to work in clay. The general shape and proportions, and the characteristics of the animal as far as you can show them, are the things that you should try to represent.

Some children find it hard to get clay, and often it



takes a good while to get it, even if you know just where to go or to send for it. Here is a recipe for something that can be made at home to take its place. Mix one cup of cornstarch or flour with two cups of salt. Add cold water enough to make a thin paste and cook it, stirring constantly until it is stiff, like fudge. Let it cool before you use it.

Another way in which we can use the animals on the Source Picture to help us make drawings that are really our own, and not just copies, is to conventionalize them, and use them in one way or another as units in designs for decoration. Any one of the animals on the Source Picture might be drawn very simply and used in borders with extra lines, or fitted into spaces of one kind or another, and by fitting them into a space, or repeating them in a border, you will find it necessary to make your own changes, and so invent a drawing that is really new and really yours.

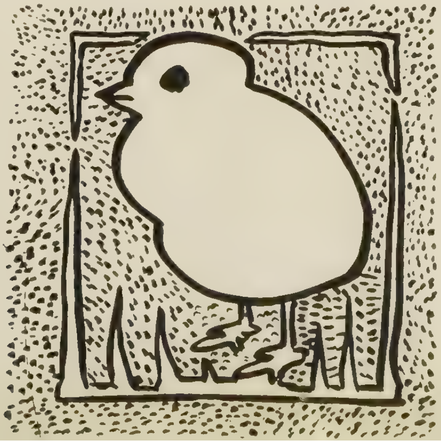
Often, when you go into a public building such as a library, or a church, or a City Hall, you will see spaces on the walls that have been filled in with pictures, sometimes with very beautiful ones. Many are in the shape of half circles or ovals. If you look at them you can tell how the artist, each time, planned to make his picture fit into that special space, and you will see how he has often added lines that help to make it fit. Not all the animals on our Scroll can be fitted into squares or circles. Some of them will need oblongs. Some will fit nicely into triangles. It is fine

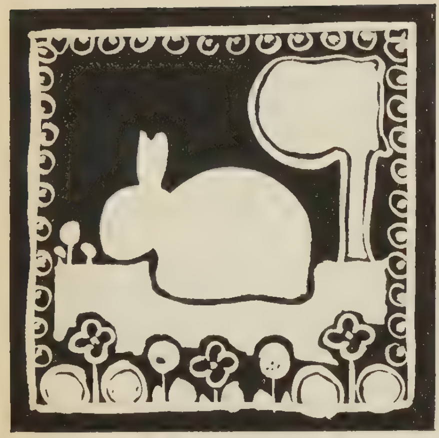
practice to make designs of this kind because when you plan a design you really create something. That is what an artist does. A man who simply copies can never be a great artist. He must change things, and make them fit into the place he needs to put them—plan designs for his spaces and use his imagination until he makes something that is really his.

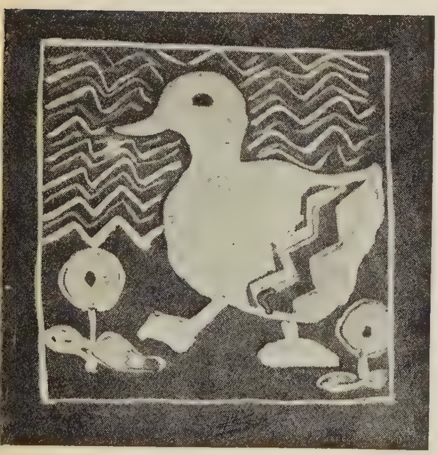
One rainy day four children who understand some of these things decided they would draw designs, and use the animals on this Source Picture (No. 14) for the units. First Michael and Henry tried drawing the squirrel.

"Just for fun I think I'll him put in a square," said Michael. He had a piece of paper and did his drawing with a brush and the brown Hy-San paint. You will see his drawing on page 196. The little shapes all around the edge of the square were nuts, he said. As you see, the squirrel has been changed. It is not really a copy of the squirrel on the Source Picture, nor is it a realistic picture, but it fits very nicely into the square and makes a good design. Just above it you will see the picture of the squirrel that Henry drew. He put his in a circle and put in some extra lines that curve a little and help to fill the space on either side. And on the bottom of this page there is a picture of a chicken that their cousin Joseph drew. He put him in a square as you see, with some extra lines that follow the shape of the square, and lots of little dots to make a background.

Then Henry tried making a picture of the chicken







on the drawing board of his Desk. He marked off a square with his white crayon and drew the chicken standing next a little flower. He left the little black lines to show the eye and the bill and the wings, and put some dots all around the outer edge for a frame.

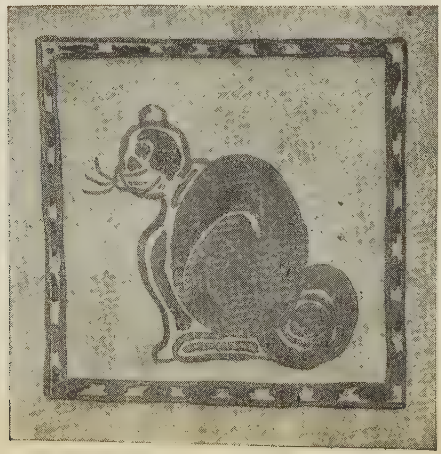
"Look!" he said, "here is a picture all in dark and light. That's what the drawing teacher calls a picture in two values."

Just then sister Sally came in and she thought that such a good idea she wanted to try something like it.

"I am going to make one where the chicken is dark and the background is light," she said. And so she drew the dark chicken and made him stand out against her white background by leaving the thin black line all the way around outside his white outline. By this time the children were quite excited about making designs in dark and light values and fitting them into spaces. They practiced them on their paper and on their drawing board, and made the rest of the designs that you see on this page and the next. Sally made the white rabbit under the tree with the flowers growing down in front. She did that one on the drawing board. Michael made the duck waddling along between the two flowers with the wavy lines back of him.

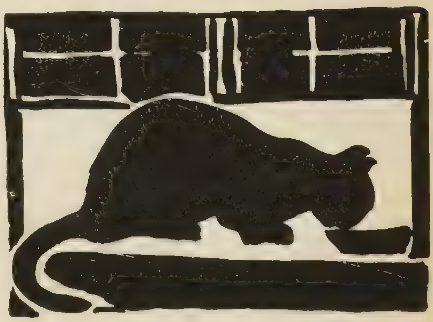
"That's water in the pond," he said.

Joseph and Henry tried some cat pictures. First they tried putting the cat in a square. They were rather disappointed with the way she looked. Henry tore up his design and would not let anyone see it.

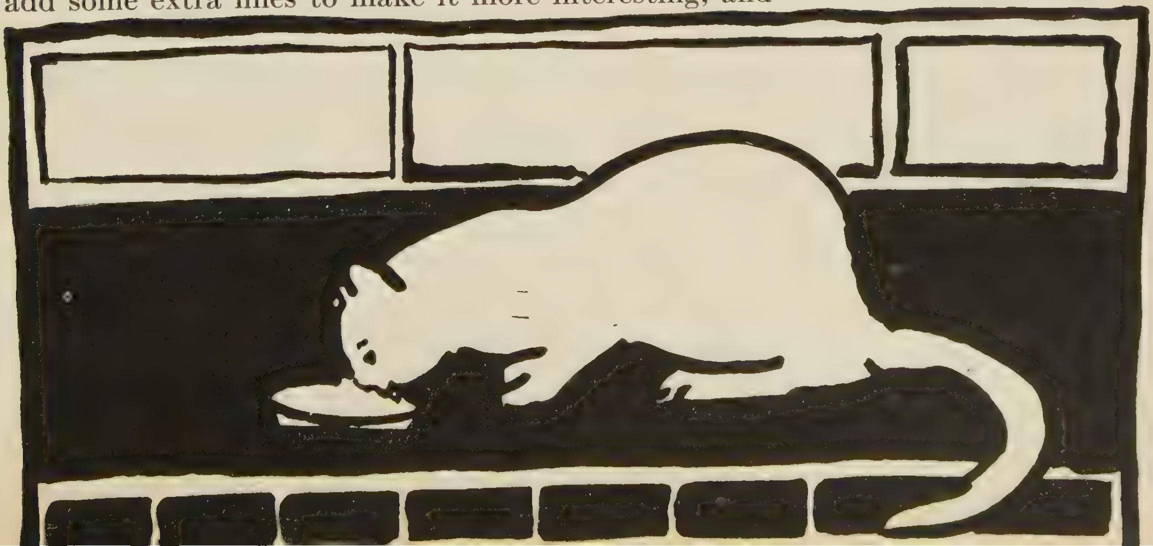


Joseph's cat, on page 198, is odd looking but she makes a fairly good design and fits the space well.

Next Michael and Joseph tried fitting the cat into an oblong space. In that way they were able to draw her lapping up her saucer of milk, as she is doing in the Source Picture. Joseph drew a black cat and Michael drew a white one. Instead of keeping the backgrounds all black or all white, they divided them into both dark and light spaces as you see. This made a more pleasing design, and a more interesting one to draw. They used some extra lines too, and those added a good deal. Michael tried to show the bricks in the floor of the porch where he imagined the cat was eating, and put in some lines to suggest that there were long windows behind him. Joseph put some white lines in the black space above his cat.



From the different designs that these children made you will surely gain some ideas that will help you to make designs of your own. Each one of the children's pets on the Source Picture can be used as a unit. Try first with a white crayon on your drawing board, and use just the two values, dark and light, the dark green of the board and the white of your crayon. Or draw them freehand with your brush on paper using just the brown or the black Hy-San paint. Choose your shape and try to make your design fit into it, whether you make it long and narrow, or make a circle or a square. After you have put in your animal outline, add some extra lines to make it more interesting, and



to fill in the background. The extra lines should be curved if your space is a circle, or straight if the lines of your space are straight. You can also divide up your background into dark and light spaces, as Henry and Joseph did in drawing their designs of the cat.

CHAPTER XV

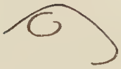
Animals of the Farm

Michael, Henry, Joseph and Sally always had great fun with Aunt Harriet when she came to make a visit at their house. Aunt Harriet could always think of interesting things to do, and she loved to draw animals, so after school and on Saturdays she would often help them when they were working with their Chautauqua Desk. One day when some of them complained that the animals on Source Picture Number 15 were very hard to draw, she showed them how she used to draw animals when she was a little girl.

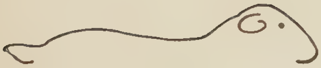
"The animals on this Source Picture," she told them, "are hard to draw because they are all four-legged animals. And they are all standing up on their four legs instead of sitting or crouching as the animals in the Source Picture of The Children's Pets were doing when their pictures were taken. When you are drawing an animal of this kind, think of your geography lessons and 'bound' him top, bottom, head and tail, just as if he were a state that you were bounding on the north and on the south, and on the east and on the west."

"Show us how," said Michael.

So Aunt Harriet took the drawing board and a piece of white crayon, and she chose the sheep to begin with.

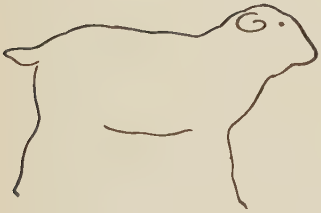


"I am not going to copy the sheep on the Source Picture," said she, "but I am going to take a good look at him just to remind me of some of the things I want to remember, and then I am going to begin and draw him out of my head. I'll draw his head and back first, because that will give me the big, important lines that will show me just about how big all the other lines ought to be." So, then, very quickly, and beginning with the sheep's nose, Aunt Harriet drew the outline of his head and back ending up with his tail as you see it on this page.

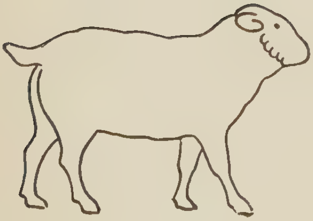


"Now he is bounded on the north," said Joe.

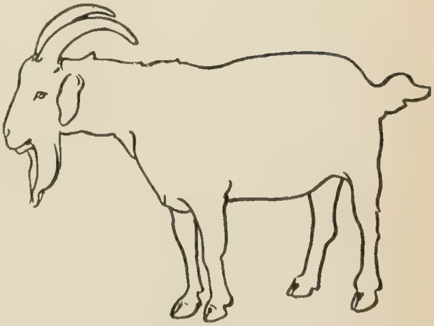
"You are right," said Aunt Harriet. "And while I am about it, I may just as well put his ear over here where it belongs. And now I'll bound him on the south, just a little line that will show about how fat I want to make him. Then the east line, here in front, will curve a little to show his woolly throat and his leg and hoof, and the west line on the other side will give me the shape of his hind leg."



As you can see from the drawing, it was very easy to finish up the sheep after Aunt Harriet had bounded him in this way, and all the children tried it one after the other. Of course only one at a time could use the drawing board of the Desk, but Sally and Joseph each had a Hy-San Art Slate, that they used, and Henry used a soft brown Hy-San Pencil on a big sheet of

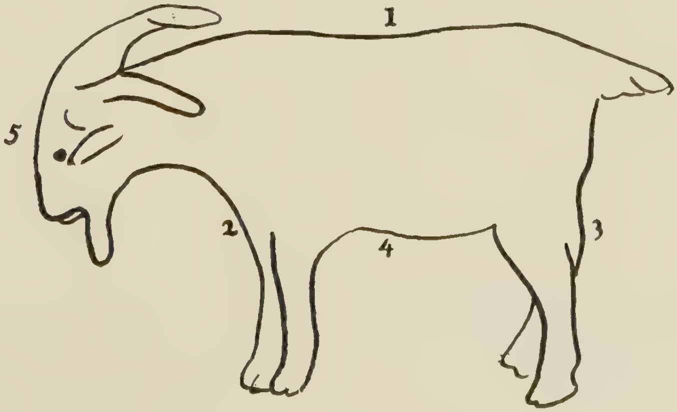


paper. On this page and on pages 204 and 205, you will see some other animals that Aunt Harriet drew for them in this way. Generally she began by "bounding them on the north," as she called it, putting in the line of the back and the top of the head. So that line, as you will see, is marked 1. She drew the others just as you see them numbered—2, and then 3, 4, 5. When she drew the pig, she "bounded him on the south" first, for she said it was not always necessary to begin with the back and head. She drew the goat because the children especially asked for a goat. She told them to try the pony and the watch-dog on the Source Picture by themselves, and make up their own boundary lines for them.



Each time after the children finished their outline, they compared it with the drawing on the Source Picture, for they found that even though their own picture was quite different from the model there, the Source Picture drawing would help them in some way to improve their own. They could see, for instance, whether they had made the legs too long or too short, whether the ears were on the right part of the head, and how long they ought to make the tail, and things of that sort.

As they drew them they used to talk, too, about the work the different animals did, and how, once upon a time, ever and ever so long ago, the beasts' great,



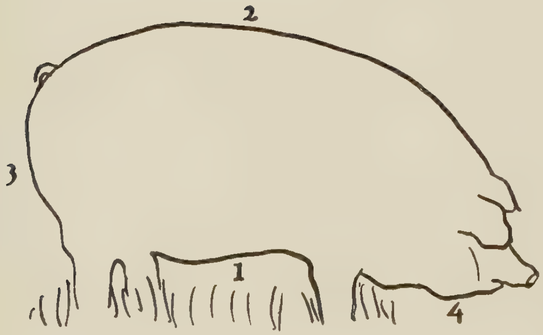
great, great grandfathers had all been wild animals, and some of them very, very fierce.

"The dog looks pretty fierce now," said Joe. "I wouldn't like to have him think I was his enemy, no matter how tame he may be. He's too much like a wolf. I don't believe the cow or the sheep could ever be so fierce, no matter how wild they once were."

"Perhaps you are right," said Aunt Harriet, "but nearly all animals have to be fierce when they are wild. They have to protect themselves from other animals. When they are tame, as these animals are today, the people who own them protect them and take care of them, and of course it is not necessary for them to be so fierce. But I think we know enough from stories we have read, to understand that wild horses and wild cattle can be pretty dangerous sometimes. And in old days, the cousins of our quiet friend, the pig, were the fierce, wild boars that people in the countries of Europe used to hunt, and found very fierce indeed."

"I think what they eat makes them fierce," said Henry. "I mean the dog eats meat, and none of these other animals do. Doesn't that make animals fierce, Aunt Harriet?"

"Yes," said Aunt Harriet, "I suppose the fiercest animals are the meat-eating animals because an animal that eats meat must always prey on other animals when he is wild, and of all the animals on this Source Picture, the dog is the only one of that kind. He is



'carnivorous' as people call it. The others all eat the food the plants make for them,—grass and grains, and things of that kind. They are 'herbivorous' animals, and so for that reason, perhaps, it is easier to tame them and make them gentle, easier to make them forget their wild life and the fear of other animals that once made them so fierce."

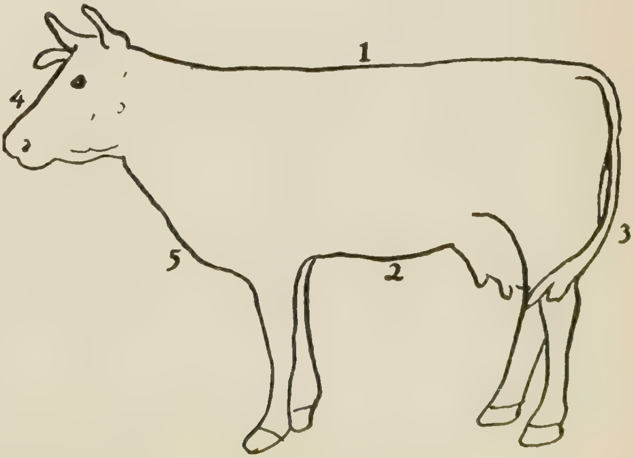
One day Aunt Harriet came in and found Henry trying to copy the pony on the drawing board. He was very much discouraged.

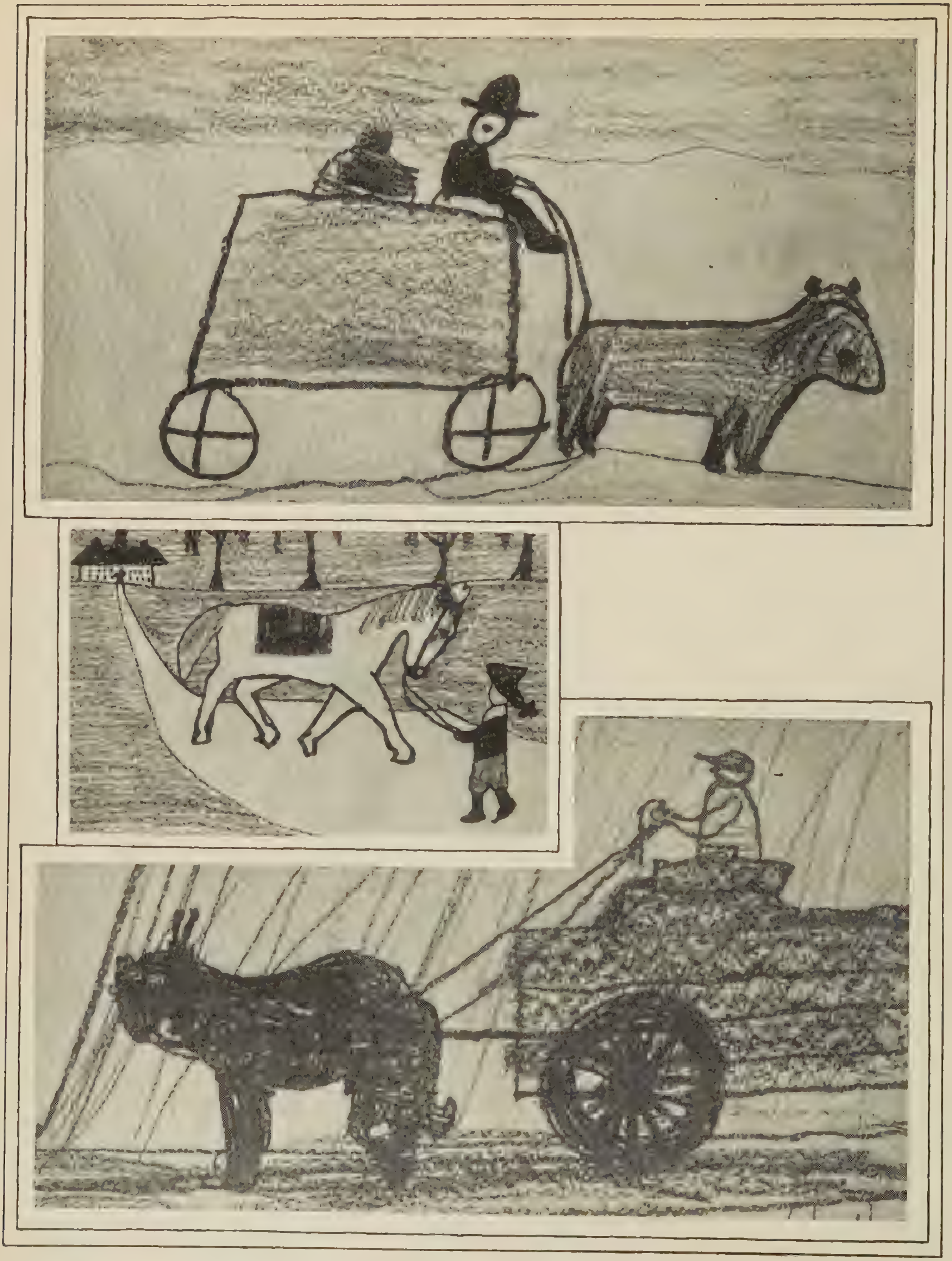
"I can't make it look the way I want it to," he said. "It doesn't seem to make any difference whether I try to copy the Source Picture or to draw it out of my head, I can't make a good one. I think a horse is just about the hardest thing there is to draw."

"Let me see," said Aunt Harriet. "Why, Henry, that is a very good horse you have drawn. You must not be discouraged just because yours is not as good as the one in the Source Picture. Remember that was made by a grown-up artist who has studied a great deal and drawn a great many animals of all kinds. Boys and girls cannot be expected to draw like grown-ups. You can be satisfied if you make a good drawing for a boy of your age."

"But how do we know," said Michael, "when we've done as well as we should? Is there any way we can tell?"

"There is always one way to tell," said Aunt Har-





riet. "If you have done the very best you can,—tried just as hard as you could,—that is one way to tell and a very good one, perhaps the very best way in the world. But if you like I will show you some drawings that were made by children just about as old as you are, and they will give you some idea of whether your drawings are good ones for children of your age."

"Oh! do! do!" cried both the children, and Sally and Joe over in the corner stopped their work and joined in the request. So Aunt Harriet went to her room and brought out a little portfolio. In it were some drawings that had been given to her by different children that she knows and visits.

"Here," she said, "is a picture that was made by a little boy six years old. He drew it out of his head, and I suppose if Henry had drawn it when he was six years old, he would have felt discouraged, just as he does about the horses he has been drawing today, but this is really a good picture, and if any child six years old can draw as good a horse as this, he can be satisfied. If he cannot, he ought to keep on trying over and over until he can. Of course some six-year-old children can draw better horses. Many can, in fact, but there is no reason why the child who drew this should feel discouraged just because some boys and girls of his own age can do better. If he tried, when he was drawing it, to do the very best he could

and succeeded as well as this, he should understand that he has done well, as well as most boys and girls could do. His picture shows that he remembered a great many things. You see the man is sitting up on the driver's seat and holding the reins. There are wheels on the cart and a load of something on behind."

"Oh! Aunt Harriet," cried the children, "we can all do better than that!"

"And you ought to," said Aunt Harriet, "because you are all older than he was. Now here is a picture that a little girl seven years old drew. You see her horse is very much better than the other one. She had just been to the circus and wished she could have a pony that would do all the things the trained horses in the circus do. And here is a picture that was drawn by a boy eight years old. You see his horse looks much more real than the other two. You can see he is a special kind of horse, one of these big work horses that are used for drawing trucks. You feel how strong and round his muscles are. He is a fine horse even though his shape might be improved."

Henry looked at the third horse a long time, for Henry was just eight years old.

"Well," he said, "I believe I can do as well as that now, and perhaps if I keep on practicing I can do a good deal better."

"Well, if you do," said Aunt Harriet, "you can be satisfied, for this is a good horse for anyone to draw when he is eight years old."

"Haven't you any horses that were done by older children?" asked Michael.

"Yes, here are two. A boy nine years old drew this pony. He drew the goat, too. He and his brother have good times after school with their pets, as you can see from the picture. This boy draws better than most boys of his age. If Henry is able to draw as good a pony as this one a year from now, he can feel very proud. And here is a horse that was drawn by a big girl, twelve years old. You see she made a design in a square and she made it in two values, dark and light like those you children were making the other day."

Every one admired the big girl's picture.

"See how she divided her background," said Michael. "The light space with the trees in it keeps the dark

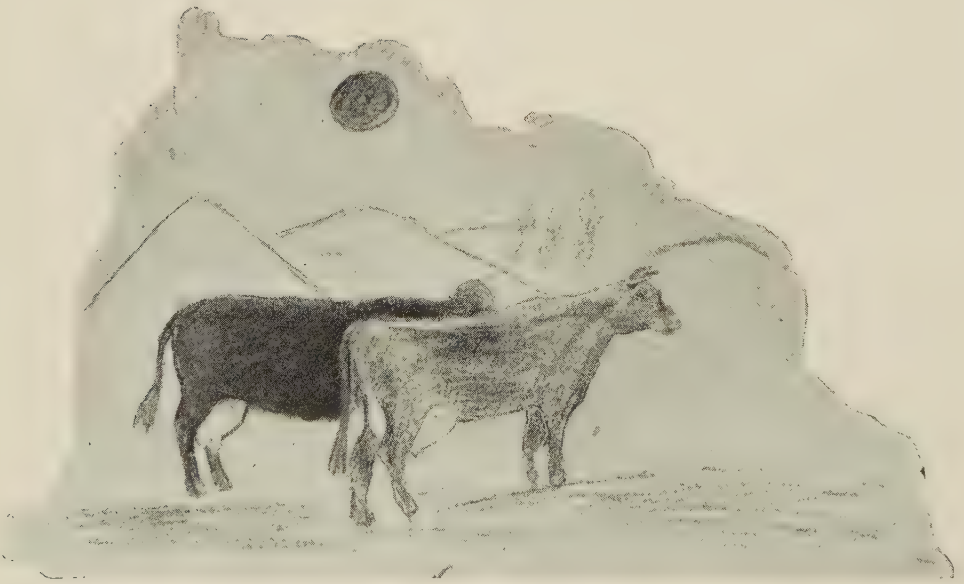
space from being too big and makes the picture interesting."

Then Aunt Harriet showed them the picture of the rabbits that you see on page 187. They were drawn by a little boy only six years old.

"He draws far better than most boys of his age," said she, "and so do the two boys who made these pictures of cows. They are only seven years old. The picture of the two cows going home to be milked is quite a wonderful picture for a boy of seven. Many grown people could not begin to make as good a picture of cows as he has done."

"This one is a cut-out!" cried Joseph.

"Yes, that was done by another boy who loves to draw animals," said Aunt Harriet, "and he draws most of his pictures with his scissors. You can see what a good memory he has. He knows the way a cow stands and moves. He called his picture 'Cows Crossing a Bridge.' Do you see how he made their reflections in the water? He cut the picture out of a piece of wrapping paper and colored it with his Hy-San Colors. It is one of the most interesting cut paper pictures that I have ever seen."



CHAPTER XVI

Animals of the Zoo

When you make cut-outs of animals, do you put them in pictures afterwards? That is what Michael and the other children do. For instance, if they make a polar bear like the one on Source Picture Number 16, they make an Arctic Scene with lots of snow and put one or two of those Esquimaux houses that are called "igloos" in the distance. Sometimes they put in the midnight sun, very low down in the sky, as it always is when it shines at all in those cold countries. Sometimes they put the bear on an ice floe, one of those big floating cakes of ice, and let him look down over the edge, as if he were watching for a fish. Then when they make the camel, they draw a desert scene, with palm trees and an Arab tent in it. They make jungle scenes for the elephant and the lion, and sometimes they make a cave for the lion's den.

They were making cut-outs of this kind one day when Aunt Harriet came in and watched them at their work. The boys all made their cut-outs very much as if they were drawing the animals with a crayon. They began with the big lines of the back and head. Next they generally put in what Michael called "the rear elevation," the long lines of the flank, hind leg and tail.

"After you have done that much the rest is easier, because you can tell about where things ought to go, and how big to make them," said Joseph.

"That isn't the way I do it," said Sally.

"No, Sally begins in a new place every time and cuts anyhow," said Michael. "I've shown her the best way I know and she won't even try it."

"Yet she makes very nice cut-outs," said Aunt Harriet. "Different people do things differently you know. Then, too, Sally is younger than you are. You must remember that, Michael. You are ten years old and she is only seven. I believe her way of working is really a better one for a child her age. But tell me, just what is the best way, do you think?"

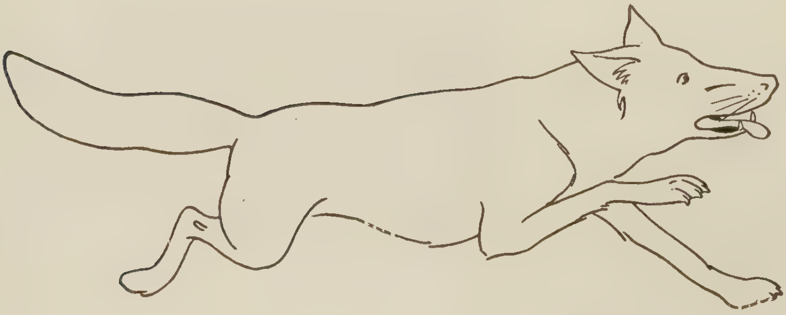
"Why," said Michael, "I always imagine a shape that will fit the animal I'm cutting out. All these Zoo animals fit into oblongs, but the elephant and the camel will almost fit a square. Whatever the shape is, I cut a piece of paper like it, then I know just how high and how long my animal will be. After that I divide up the whole space in three parts, just in my head, you know. The head and neck need about one third, the front legs and the body another, and the hind legs and tail will take up the other one. It helps you a lot to do it that way."

Aunt Harriet looked thoughtful. "It *is* a good

way, Michael," she said, "but much too hard for a little girl like Sally. Indeed I think many grown people would find it hard, and not many boys of your age would have invented it for themselves. It is a fine thing to be able to plan spaces and to see things in their right proportions like that. All children should try to do it as they grow bigger, but not everyone succeeds in doing it, even when they are much older than you are."

When the children grew tired of making cut-outs, Aunt Harriet suggested that they try the "shut-eye game". This is a game that tests your memory for drawing, and the children found it great fun to play. They used the drawing board and the Hy-San Art Slates when they played it, because it was a great advantage to be able to erase their drawings quickly. This is the way they played the game: They would choose one of the animals and look at it very carefully for a few seconds. Then when Aunt Harriet said "Ready!" they shut their eyes and tried to keep the picture of the animal in their minds just as it looked on the Scroll. Then with their eyes shut, they would draw the outline as they remembered it. They drew it quickly but just as carefully as they could, and without once looking to see what their shut-eye picture looked like, or even if they were making the different lines join where they should. Next—and this is an important thing to remember about the game—with

their eyes still shut, they would take their erasers and rub out the shut-eye picture without even once looking at it. Then they would make a drawing of the animal all over again, this time without looking at the Source Picture. This was the "open-eye" picture. Henry said the game might much better be called the "open-eye game" because, after all, the important thing is this picture that you make at the end. You try to draw it just as you remember the Source Picture, and just as you drew the shut-eye picture, or thought you drew it, because, of course, you never really knew how that one looked. When they had finished making the open-eye picture, they could compare it with the model on the Source Picture. In this way they tested their memories, and proved to themselves and to each other, just how many of the important details of each model they really knew, or rather how many they could keep in mind and put into a picture. Sometimes when they played this game with Aunt Harriet, she would put up a prize for the very best shut-eye picture of all. They practiced shut-eye pictures of all the different animals on the Scroll and of many others. At first they tried making them only from the cut-outs. Then they chose the easiest of the outline pictures. This is a very good way to do, because when you first start in to play the shut-eye game, it is really surprising how hard it is to keep the memory of the model in mind. Indeed the children were very much surprised at first to find how



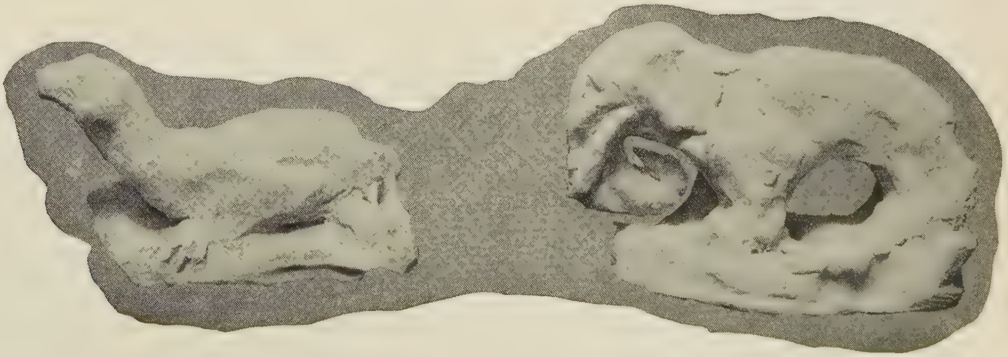
different some of their pictures were from the models that they were trying to remember, even the very easy ones.

One day, Joseph and Henry went to the Zoo and when they came back they got out their clay and made some clay pictures from memory. On this page you will see the elephant that Joseph modeled, and Henry's seal.

"If we had only had our clay right there at the Zoo," said Henry, "we could have looked at the animals again afterwards, and our pictures would have been a lot better." But Aunt Harriet thought they were very good figures for boys eight and nine years old to have made, and she told them so.

One day the children tried making borders of a new kind. Michael and Joseph had been learning at school about "neutrals"—that black and white and gray are called "neutrals", and that when you use all three together in a picture or a design, it will have three values, dark, light and a middle value in between, made by the gray. They thought it would be fun to try some, so they told Aunt Harriet and the other children about it. Sally and Henry thought a picture just in black and white and gray would be very stupid. Aunt Harriet suggested that it might be more interesting if they should use one color with the neutrals, but the two younger children decided they had rather make shut-eye pictures.

So they played by themselves, but Michael, Joseph

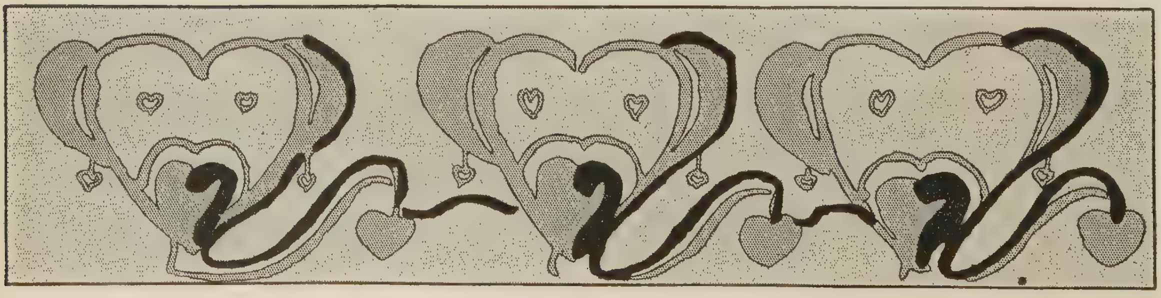


and Aunt Harriet made some borders with neutrals and a soft shade of blue that Aunt Harriet mixed by putting a good deal of white and a very little black with the paint made from the blue Hy-San Crayon.

While Aunt Harriet was mixing the paint, Michael cut three strips of manila paper to use for the borders. He made them three inches wide and twelve inches long.

It was just before Valentine's Day, so Joseph decided to make a design that would do for a Valentine. Taking the blue paint on his brush, he drew three big hearts right across his strip of paper. That gave him three strong units. Then he put little hearts in between the big ones, and that gave him his weak units. Then he tried putting in some extra lines to connect them, and pretty soon he began to laugh as a funny idea came to him.

"What are you laughing at?" asked the others, but Joe only laughed again and told them to wait until he had finished. When he showed them his funny design, everybody laughed, and tried to decide whether the unit was more like an elephant or more like a heart, and when you see it at the bottom of this page, you may find that as hard to tell as they did. Joe only used the blue paint with a few lines of black to make his design more striking. Aunt Harriet asked him how many values he had used and at first he said two, but then he remembered that the color of the paper made a background and was really part of the

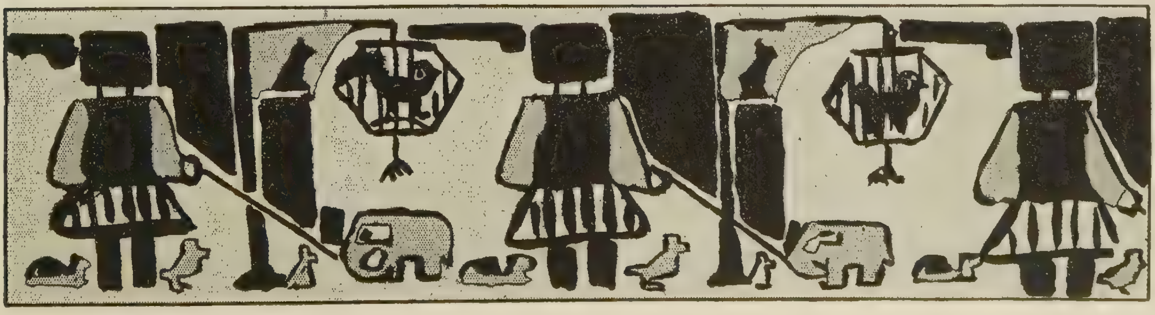


design, so that made another value. The manila paper was the lightest in value and the blue paint gave a middle value, so with the black he used for emphasis, his design had three values in all.

Aunt Harriet's design had three values too. She drew the border on this page, with the bird cage and the toy animals. She said the little girl was Sally. As you will see she used a good deal of black, with the background of the manila paper for her light value, and only touches of the blue middle value.

On page 218 you will see the border that Michael made. He chose a duckling for his unit, and made him turn his head to look at a flower behind him. The outlines were drawn in blue. He put in black lines in places where they seemed to make the design more striking, and dashes of white to set off the pattern in other places. When he had finished, Aunt Harriet showed him that his border had really five values in it. The black and white touches made the dark and light values, the gray and the blue paint made two more values, one a little darker than the other, but not so dark of course, as the black, and the manila paper which made the background and was left showing through the design here and there made a fifth value, lighter than the others, but not so light, of course, as the white.

Joseph's heart and elephant border made everybody else feel like trying a design with an elephant in it. So Sally and Henry and Michael and Aunt Harriet



set to work to see what they could do. Aunt Harriet took a long piece of dark blue paper and cut it into strips three inches wide so everyone should have a strip for a border, and they decided to paint their designs in light colors on the blue background. Each one chose the colors they wished to use and mixed them with a good deal of white so as to make light values on the dark paper. And with each color they mixed a very little blue to make it harmonize better with the background. Then they turned the Scroll to Source Picture Number 16 and took a good look at the elephant before they began.

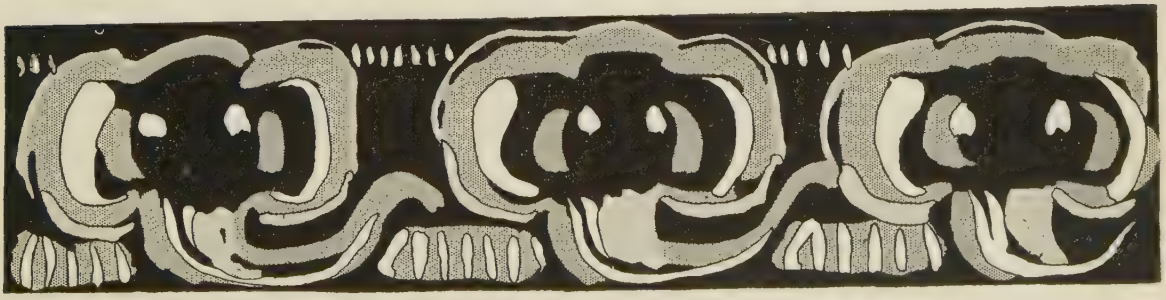
"Let's try to make him into a good design," said Aunt Harriet, as everybody set to work with their paints and brushes. "That was what made Joseph's border so interesting. He was not trying to make an elephant so much as to invent a design."

On pages 219 to 222 you will see how the elephant-borders looked when they were finished.

Sally did the first one, with the three heads on it. She drew them in violet on the blue background, and then put in dashes of salmon pink, light blue and white. It was really a splendid design for a little girl seven years old to make, and Aunt Harriet was delighted with it. On page 221 is the one Henry made. He drew the whole elephant, and made him square at the corners to fit the straight edges of the border better. He used salmon pink for the outline, and filled in some parts of his design with light blue and some parts

with violet paint. Aunt Harriet drew the one on page 220, with the elephant heads in pairs, each one facing a different way. She outlined the heads in white paint and filled the spaces in between with pink and gray. The children liked her border best of all, but she liked the one Michael drew (page 222) because she said, "Michael's elephant has been lost in his design." When you look at his border you will understand what she meant. To be sure you can still see the elephant's trunk, and something that reminds you of his big ear, and of the fact that he has an eye, but unless you happened to know beforehand that Michael had started out with an elephant as his unit, you would really never have guessed that his unit was anything more than an interesting pattern in light blue on the dark background, set off with a few dashes of pink and white.

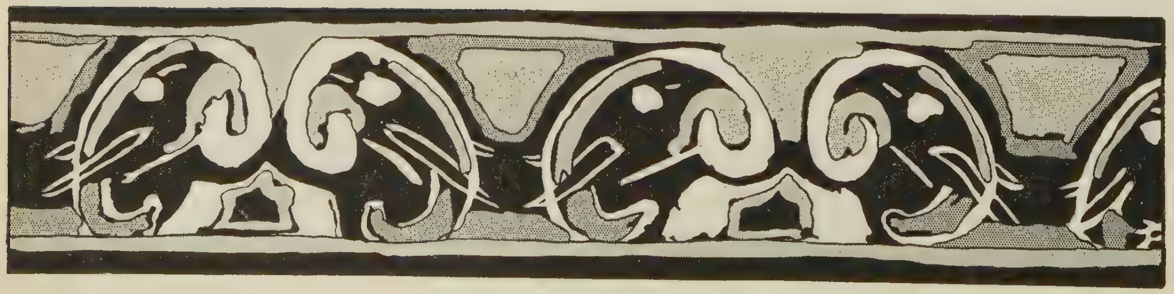
"Michael has done something very interesting indeed," said Aunt Harriet. "He has invented something that is just a design rather than a conventionalization of the elephant as it started out to be. Many of the units that artists use over and over again today in their designs, were invented long ago by people who did just that thing,—began by conventionalizing something and lost sight of it in the design. Then after they had used their unit over and over perhaps, other people copied it and used it in their designs until at last everyone forgot what it was supposed to be. So today we think of it only as a design unit that is use-



ful and ornamental and no one knows or really cares what it is intended to represent. The 'egg and dart' pattern that architects use so much for mouldings, and the design that people call the 'Greek key' are units of this kind. So is the 'Swastika' sign that so many people think a good luck symbol. Many of the designs we get from the Indians are of this kind. Some were intended as pictures of the lightning, or of water, or of mountains, for example. The Indians know what they mean and use them as a sign language, but we borrow them without thinking of their meaning, just because they are good designs and fit well into spaces that we are decorating. Any one of us would do the same thing in the end, if we should draw the elephant over and over, and think more about filling our spaces than about making his picture look real. We would end by inventing a unit of that kind,—one that is just a decoration and has lost the meaning it had when we started out with it."

"Is that a good way to do?" asked Joseph.

"The very best of all ways if what we want is just a decoration," said Aunt Harriet. "Of course, if we want our design to carry the idea of the original unit, we must not lose sight of it ourselves. If we make a border for an Easter card, for instance, we will want to keep the chicken, or the lily, or the rabbit of our unit real enough so that people will recognize it as a symbol of the season. But the very best designs, so artists tell us, are those that have been conventional-



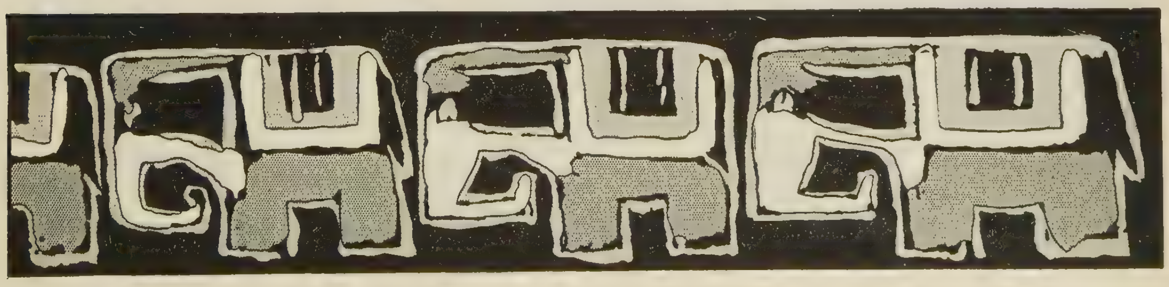
ized until their meaning has become of no importance aside from the graceful patterns that they make in the different kinds of spaces that they decorate."

One day, just before Aunt Harriet finished her visit, she and the children had a long talk about animals, and how important it is to know about them and what they are really like, if you are anxious to make good pictures of them. The kind of food an animal eats, the country that he lives in, the other animals that live there and against which he must protect himself if he is wild, the kind of work he has to do if he is tame,—all those things are important to know, if we are to understand the animal and make a good portrait of him.

"When you are studying an animal," said Aunt Harriet, "it is a good idea to think of the first Source Pictures on your Scroll and ask yourself the questions that they answer about the children,—where they live, what they eat, what they wear, how they travel. And in addition we must always ask how an animal protects himself from other animals, whether he has been made strong and fierce and able to fight his enemies, or perhaps gets out of their way by running very swiftly, or by climbing or springing."

"Let's see what we can tell about the Zoo animals on the Source Picture," said Michael. "I know the camel's hump is made of fat, and that he can live on it and go without eating for ever so long."

"Yes," said Joseph, "and he doesn't have to drink



either, because he has extra stomachs to store water in. That's what makes him able to travel across the desert in the way he does."

"Notice his feet, too," said Aunt Harriet, "how big and soft they are. They have big pads on the soles to keep him from sinking into the sand as he walks. But none of those things can explain the haughty look he has. Perhaps that comes from having such a long neck and always looking down at the other animals and even at his own master."

"The polar bear has big feet," said Henry. "They must be padded, too, like the camel's."

"Yes," said Aunt Harriet. "He needs thick pads to help him walk over the cold snow and ice. All his body is padded with fat, underneath his heavy fur coat. That is how he keeps warm in the Arctic cold, and swims for long distances in the icy waters where he does his fishing. No wonder he has such a clumsy shape. Think what lots of engine food he must have to eat to keep him fat and warm!"

"What do you think the lion is doing?" asked Sally. "Henry and I think he smells something or somebody good for dinner."

"Yes," said Joseph, "and he is just waiting for his prey to come nearer. You can tell by his tail that he's excited."

"Well, I am glad that he is not looking my way," said Aunt Harriet. "Big as he is, 'King of Beasts' as

people like to call him, he can spring and climb and is as agile as our own pussy cat, and his paws, like hers, hide terrible claws that make him the match of enemies far larger and stronger than he is. The elephant, for instance, has a hard time fighting a lion or a tiger."

"Is an elephant a wild animal or a tame one?" asked Sally.

"Wild," answered Henry.

"Tame," said Joseph.

"Both," said Michael, "but he's best when he's wild. Then he has his big tusks to fight with, and he tears around and sometimes pulls up whole trees with his trunk. I've read about it."

Aunt Harriet laughed. "I like him best when he's tame," she said. "Then he doesn't have to fight. His master protects and feeds him, and he makes a useful and devoted friend. Elephants are very wise animals. They live to be very old, and they have wonderful memories. Once I went to see some circus elephants that were taking a vacation. Their owner had put them in a big, quiet field by a river where they could spend a few weeks out of doors in the summer, and have all the fresh hay they wanted and wade and play in the water. While we were standing, looking at them, an auto drove up, and some people got out of it. One of them was a pretty woman, who walked over very near where the elephants were enjoying their dinner. When they saw her, quick as a wink, all three of them stopped eating and threw their trunks up over their heads, and stood very still. That is the way an elephant salutes, or in other words, pays his respects to you. The pretty woman laughed and then she cried a little. 'You dear, dear things!' she said, and she patted them and called them by their names. For when she was a little girl she used to ride those elephants in the circus. And now she is grown up and married, and lives far away. 'But they never forget me, no matter how long it is since they have seen me,' she told us. 'An elephant always remembers you. He is a real friend.'"

"What will we do when you go home, Aunt Harriet?" said Joseph. "You make the animals on the Scroll seem interesting no matter how many times we draw them. Tell us something we can do by ourselves after you have gone."

"Yes, and then we'll surprise you when you come again," said Henry.

"Well, I have been thinking," said Aunt Harriet, "since you are all so interested in drawing animals, that it would be a fine thing if you should learn the verses Professor Knight wrote for his children, when they were little. That would give you a long list of different animals, birds and insects, a great many of them quite new to you perhaps. It would be a wonderful thing to be able to draw them all, and to know all the things about each one that you really need to know, in order to make a good animal portrait. You

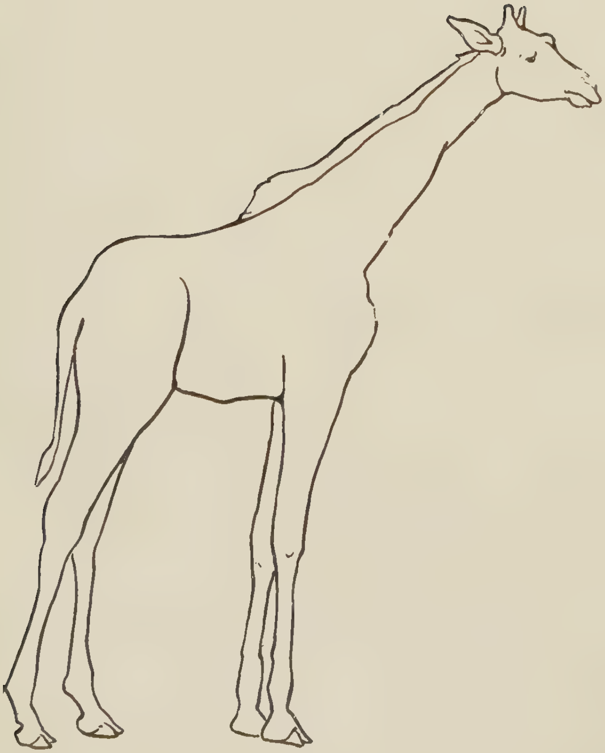
would have to hunt some of them up in the dictionary or in an animal book I am sure, and you can find pictures of some of them in magazines and newspapers. Some of them you can see in the Zoo, if you have a chance to go there. Draw as many of them as you can and have a lot of memory drawings, or perhaps sketches from the live animals to show me when I come again. If you like you can sing the verses to the tune of the 'A, B, C Song,' the one that some people call 'Haste Thee, Winter'."

Here are the verses. Aunt Harriet wrote them down just as Professor Knight's daughter had told them to her.

"*THE ZOOLOGICAL PROCESSION*"

Alligator, Beetle, Porcupine, Whale,
Bobolink, Panther, Dragonfly, Snail,
Crocodile, Monkey, Buffalo, Hare,
Dromedary, Leopard, Mudturtle, Bear,
Elephant, Badger, Pelican, Ox,
Flyingfish, Reindeer, Anaconda, Fox,
Guineapig, Dolphin, Antelope, Goose,
Hummingbird, Weasel, Pickerel, Moose,
Ibex, Rhinoceros, Owl, Kangaroo,
Jackal, Opossum, Toad, Cockatoo,
Kingfisher, Peacock, Anteater, Bat,
Lizard, Ichneumon, Honeybee, Rat,
Mockingbird, Camel, Grasshopper, Mouse,
Nightingale, Spider, Cuttlefish, Grouse,

Ocelot, Pheasant, Wolverine, Auk,
Periwinkle, Ermine, Katydid, Hawk,
Quail, Hippopotamus, Armadillo, Moth,
Rattlesnake, Lion, Woodpecker, Sloth,
Salamander, Goldfish, Angleworm, Dog,
Tiger, Flamingo, Scorpion, Frog,
Unicorn, Ostrich, Nautilus, Mole,
Viper, Gorilla, Basilisk, Sole,
Whippoorwill, Beaver, Centipede, Fawn,
Xantho, Canary, Pollywog, Swan,
Yellowhammer, Eagle, Hyena, Lark,
Zebra, Chameleon, Butterfly, Shark.



CHAPTER XVII

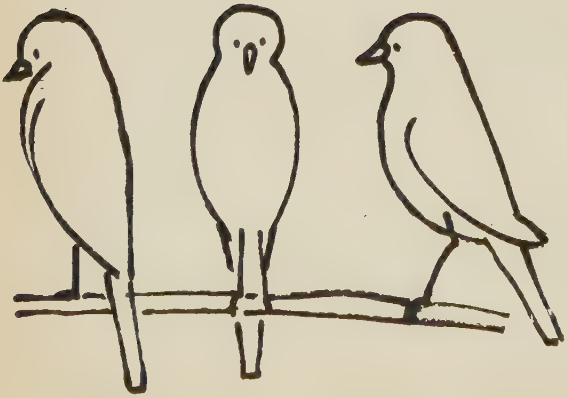
Bird Neighbors

Wherever we may happen to live we will find it worth while to get acquainted with our neighbors, the birds, and to make them our friends. Little creatures as most of them are, birds lead busy and interesting lives and are important beings in the world. Their tuneful songs, the gay plumage that so many of them have, the wonder of their flight, all give delight to us. If we watch them we will find they often behave in a very human and amusing fashion. Their nests are the most interesting of any of the homes made by wild creatures for their children.

To know our bird neighbors we must, first of all, be able to tell them apart, and to call each one by his name. That is, we must "identify" him. When we see familiar friends like the robin, the bluebird or the house sparrow, we identify them at once by the color of their dress and by their size and shape. We realize, too, that each one has other characteristics that help to give him his sparrow-like or robin-like look, but unless we try to make a portrait of him, we will not need to think of these smaller details. If, however, we try to draw his picture, we quickly find that they are very important. The size and shape of a bird's bill, of his wings and tail, of his legs, feet and toes, are all part of the outline that is as much his own as the color of his dress.

If you look at the bird portraits on Source Picture Number 17, you will see how true this is. We can identify each one of the birds shown in it because these details of shape and proportion have all been carefully observed and drawn. The blue jay looks like a blue jay, even without his showy coloring, and the pigeon looks like a pigeon, even though he is small in size as compared with the birds around him. In order to make the little details plain, the artist has changed the size scale of the different birds in the Source Picture. The chickadee and the swift have been drawn larger in proportion to the cardinal and the blue jay, just as the pigeon has been made smaller than it should be in proportion to them. Nevertheless, the likeness of each bird has been kept without showing us either its color or its size. The fact that the artist has been able to do this, makes it plain how important a part these details of head and beak, of wing and tail, of leg, foot and claw, must play in any bird outline that is familiar to us. We recognize them all, in a way, every time we glance out of our window and exclaim, "Look! There's a robin!"

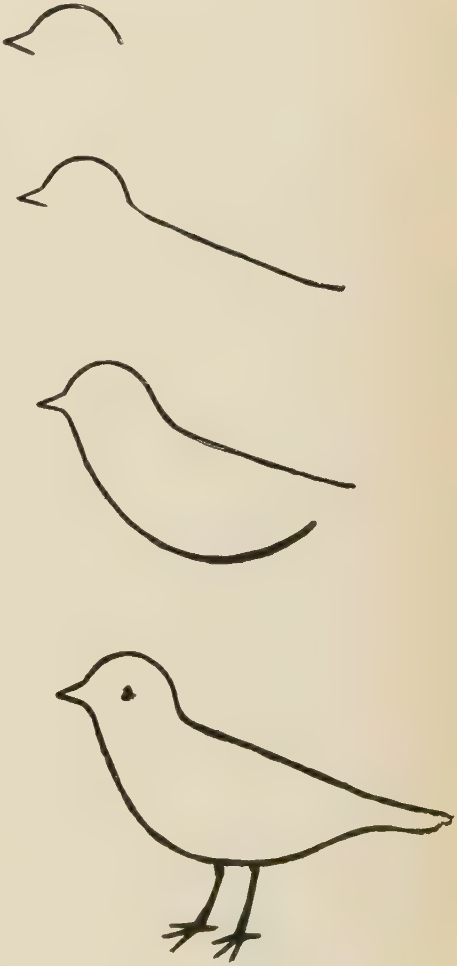
Of course some birds have outlines as different as those of the lion and the camel. Almost anyone can draw a humming bird, an ostrich and a turkey so they can be told apart, but how about a robin, a bluebird and a sparrow? It is the little differences that make it hard to draw good bird pictures. Indeed, where very careful pictures of birds are necessary—those we find in bird books, for example—special artists are always

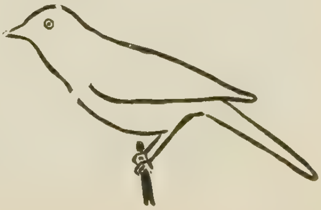


needed to make them. Such artists study the birds they draw, and try to make their pictures show the character of the bird, as well as his outline. For just as the cat is cat-like and the squirrel, squirrel-like, so is the blue jay bold and noisy, the chickadee fearless and friendly, the robin cheery and brave. Every bird has his own personality that we must know if we would make a portrait of him.

From this you will see that drawing a bird is like drawing an animal. Indeed we will find we can improve our bird pictures by using the same methods we used to improve our pictures of animals. We should begin as always, by sketching in the more important lines. Memory drawings and shut-eye pictures will help us, if we can compare them afterwards with the bird himself, or with a careful portrait of him. So will direct drawings from the live bird, and some copying of good pictures. We can cut his outline in paper and model him in clay, or in salt-and-flour mixture, and we can use his conventionalized shape in designs. But always we will find that we must have some special acquaintance with him, if our drawings are to satisfy us.

Special acquaintance with our bird neighbors is something we can have for the asking. Nowadays there are so many splendid bird books in the libraries and stores, and such fine collections in the public museums, no one has an excuse for being ignorant on the subject of birds. Even the people who live in cities can study birds, and see them in the parks and on their country rambles, if not from their windows.





Not many years ago, it was thought necessary to make a collection of stuffed specimens, and of nests and eggs, in order to study and know about birds. But few people have this mistaken idea today. Live birds are far more interesting than stuffed ones can ever be. We can see birds' eggs in the museums, and pictures of them in the bird books, without robbing nests and doing harm to the poor birds themselves. We can even make models of the eggs from clay, or salt-and-flour mixture, copying them from the pictures in the bird books and painting them with our Hy-San Colors. As for the nests, if we wish to collect them, the birds are glad to let us have them at the end of the nesting season, for a bird seldom, if ever, uses the same nest a second time.

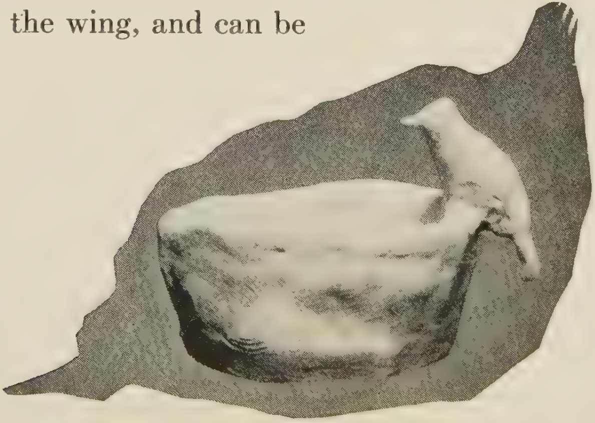
Did you ever go for a bird walk, that is, take a walk and devote all your attention to the birds you see while you are taking it? Arm yourself with a paper and pencil, and you will often be surprised to find how many different kinds you will be able to count, especially in the spring of the year. Perhaps you can make some sketches too, and if you take along a kodak, you may be able to get photographs of some of them. Hunting with a camera is a very exciting and interesting kind of hunting. It sounds easier than it really is, especially if it is a question of bringing home the picture of a rare bird, or one that is shy, like the cardinal. In spite of his bright color we seldom see a cardinal, though we can often hear his tuneful whistle down in the thickets and cotton fields of the south, where he loves to live. We can feel a special satisfaction when-

ever we succeed in watching a bird of this kind, and a greater satisfaction in bringing home a picture of him.

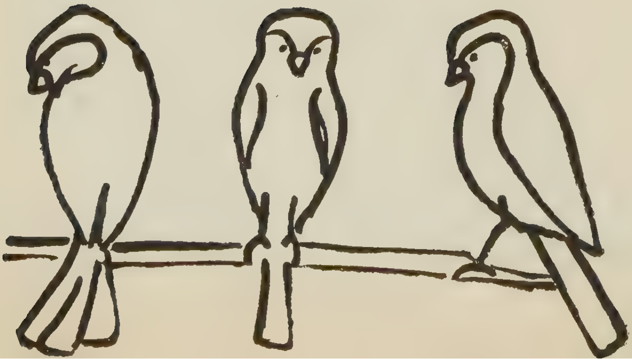
When we see a bird that is new to us, we find it necessary to describe him in a way that will make it possible to find out his name. His size and color will always be our first means of identifying him. Is he as big or bigger than a robin? Is he as small as a sparrow, or smaller still? As the smallest of all birds, the humming bird is sometimes used for purposes of comparison, but the sparrow and the robin are the two birds whose size helps us the most in describing another bird. A bird is generally larger than he looks, for as we see him hopping or flying about, he is seldom stretched out at his full length or height. A robin is about ten inches long, a sparrow, six and a quarter inches, a humming bird, three and three-quarters inches.

His color, even more than his size, will help us to find out about a bird. Is he dressed all in modest browns and grays? Has he yellow, blue or red in his plumage? Is any part of him marked in a striking way with black, or with black and white perhaps? Merely being able to answer these questions on color will often serve to introduce us to a new bird friend. Do you know the color of the different birds on the Source Picture? If not, look them up in your bird book, or find them in a bird book at the Public Library.

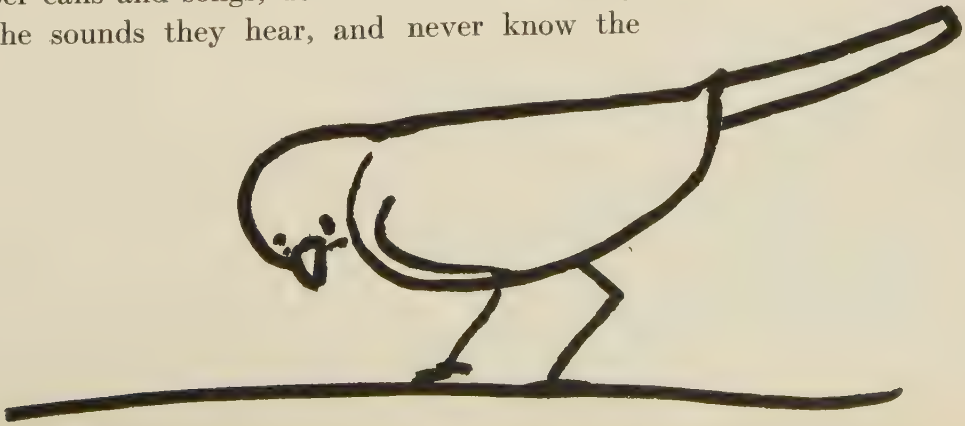
But it is not only "What the children wear" that will help us to identify our bird neighbors. "How the children travel" is quite as important a question. Birds travel on their feet as well as on the wing, and can be



told apart by their different methods of walking, running, waddling, creeping, climbing, and hopping, as well as by their manner of flying. Some birds fly straight to the point where they wish to go, and we say their flight is "direct." Others are "undulating" in their flight—that is they fly with a wavelike, up and down motion. Others swoop and soar, dive and flutter, flap or "labor," as we say of those whose flight is slow and heavy, like that of an owl. A bird who hops through the grass and along the garden walk, as so many do, is a perching bird, whose feet are made to grasp the twigs and branches of the trees. He does not creep up and down the tree trunks like the woodpeckers and nut-hatches. He cannot walk flat footed like the pigeon, and the chickens and turkeys of the barnyard. He cannot swim like the web footed water birds. Far less can he run like the long legged, flat footed birds, among whom the ostrich is prize winner, getting over the ground faster sometimes than a horse. Three of the birds on the Source Picture are of the perching kind. You can easily tell them by looking at their feet. The chimney swift, like a few other birds, has feet so small that he can neither perch nor stand. Either he must stretch his long wings and fly, or he must cling to the side of a wall or of a tree, bracing himself on the spiny feathers of his short tail to keep his balance. For this reason we never see a swift hunting his dinner on the ground or sitting on a branch. He is forever flying through the air, and his wings are so long in proportion to the size of his body that we can easily believe he finds himself more at home in the air than anywhere else.



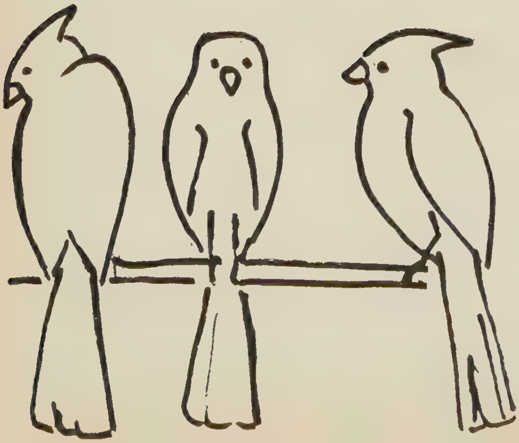
A bird may generally be identified by his voice. To recognize the different bird songs and calls that we hear about us in the spring woods and fields, is an unfailing pleasure to people who have learned to do so. No music book ever written, no musical instrument ever made can imitate exactly the clear high notes of feathered singers. In the early spring, as I dare say you know, when the birds are mating and building their nests, their singing is at its best. A little later while the mother birds are sitting on their eggs, the father birds still sing away, as if to entertain them and help pass the long days until the little ones are hatched. When that time comes the babies must be fed, and busy days begin for father and for mother bird. As summer goes by, and the bird children have to have flying lessons and hunting lessons, as well as dinners every day, we hear less and less singing. But at all times of year, in the song season and out of it, the bird calls are a language worthy of study in themselves. Many birds, the robin among them, have several different calls, and some birds imitate the calls of others. This is true of our noisy friend, the blue jay. He is no singer, but he loves to hear his own harsh voice, and is very clever at imitating other birds. Young birds learn their calls and songs from their parents, just as children learn to speak the language that their parents speak. Indeed it has been found that baby birds brought up, as sometimes happens, by foster parents of a different kind, or perhaps in cages, where they cannot hear their own proper calls and songs, do not learn them. They imitate the sounds they hear, and never know the



language of their parents. The magpie and crow, cousins of the blue jay, are talking birds like parrots and a few others. They can imitate the sound of human voices without, however, knowing what they say.

To identify a bird is the first step in making his acquaintance, but it should not be the last. We should learn to watch our bird neighbors as they go about their daily affairs, to "observe" them as the naturalist calls it. Children often feel that they must make pets of wild creatures, if they are to be really acquainted with them. But few wild birds can overcome their fear of us sufficiently to permit this. The chickadee is an exception. He is a friendly, fearless little person in spite of his small size. He will often feed from our hands, or light on our shoulders if we try to make friends with him. This is true of pigeons, too, only with them it is less remarkable, for the pigeons in America today are not wild birds. The fact that they can fly makes them seem wilder and more independent than their friends the barnyard fowl, but they are really domesticated, depending always on man for a certain amount of care.

The blue jay is an interesting fellow to observe, bold but very wary. He is exceedingly human at times, though not always polite in his behavior. Clever as he is, I once saw a bird of half his size get the better of a blue jay. It was a snowy winter's day and a little nuthatch was feasting away on a big piece of suet. This had been nailed in the crotch of a tree just outside the window where I sat. A big, saucy-looking blue jay lighted on the roof close by and started for it. It was

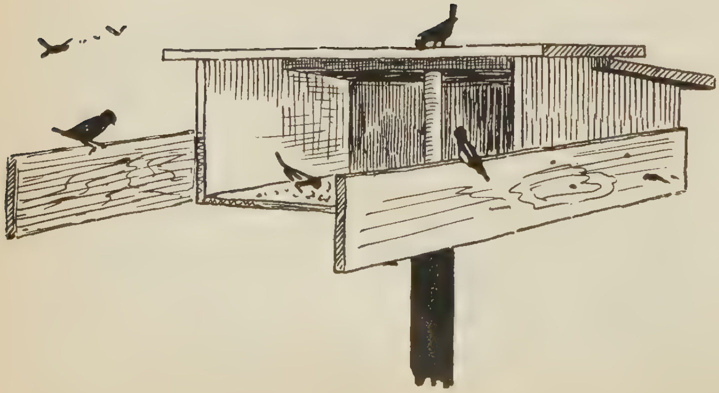


evident he intended to have a party all to himself, but Mr. Nut-Hatch refused to be driven off. He sunk his claws deep into the suet, and began to sway in a dizzy way from side to side. Something very dreadful indeed seemed to be happening, perhaps a fit. Things looked so serious that I called a friend to come and see what was the matter, and thought him very heartless when he only laughed and said, "Young Nut-Hatch is trying to show Mr. Blue Jay that that is no place for him." But after a minute, when the surprised blue jay had drawn back a little, Mr. Nut-Hatch came to himself again and took another peck or two at the suet. So, as the danger seemed to be over, Mr. Blue Jay started forward once more, and Mr. Nut-Hatch immediately had another attack of his peculiar trouble. This happened several times, until the wary blue jay gave it up and flew away. Then a second nut-hatch joined the first one, and together they finished their meal with great satisfaction. This was a very special bit of bird behavior, but it will serve to give you an idea of the amusing and interesting things we can sometimes see when we observe our feathered neighbors.

A bird table is a great help to anyone who wishes to observe birds. It should be spread in a sheltered place where cats cannot reach it. A small piece of suet nailed to a tree, will provide enough engine food to help many birds through the cold weather. Seeds and grain of different kinds, as well as bread crumbs, will be especially welcome to the birds who stay with us all winter. Most of them are seed-eating birds. Only a few of the insect eaters can find food enough to keep them through

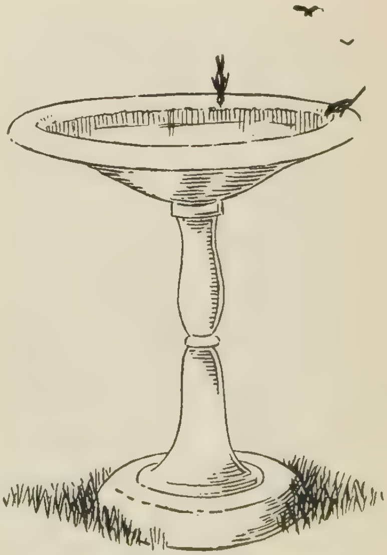
the cold months of the year, and accordingly they are the birds who "migrate," or travel south, where insect life is more plentiful. Many people think it is the cold that sends birds to the south in winter, but it is their need for food rather than cold. Birds are very warmly dressed in their feather suits, and their hard times in winter are due to hunger and thirst rather than to cold. On this page there is a picture of a splendid little feeding table that a boy or girl could easily make at home. It is set on a pole, and shaped so that it turns and keeps its open side always away from the wind. This makes it a snug place for dinner on a cold day, and keeps the seeds and crumbs put on it from blowing away. An even better way to serve the birds in winter, if we are able to do it, is to have trees and bushes in our gardens of the sorts that keep their fruit and berries until spring. The mountain ash is such a tree, so are the juniper and the sumach. Rose bushes and barberry bushes, too, keep their fruit all winter long. So do the frost grape, the magnolia, the china berry and the holly.

A bath is another attraction that will bring birds near to our houses and give us the chance to watch them. A bird uses his beak as a comb and brush when he makes his dainty toilet. He takes care that every feather is carefully washed, and dried and oiled, each day. As you may know, a bird carries a little oil sack on his back at the top of his tail. From this he can squeeze out a drop or two of oil with which to dress his feathers. Water birds use more oil than others and this helps to keep the water from soaking through their feather dresses into their undersuits of down.



Nearly all birds are busy creatures. If we should ask them about their work in the world, their answer would be very like the answer of the flowers. Merely by living and growing and caring for their children, the beings of the plant world, do a tremendous work, a work that must be done, if other creatures are to live and grow. So it is with our bird neighbors. They do much important work in the world, though they themselves are intent only on their own needs, and those of the little families on which they lavish so much care. To win their mates, and build their nests, to lay their eggs and hatch their young, are the matters of first importance in their lives, as they gladly explain to us by what they do year after year. Feeding their families and teaching the young birds all they must know, how to fly, to call, to sing, to hunt for themselves, to care for their feathers—these things take every minute of a big bird's time during the spring and summer months. Then, as the weather grows cold and food gets scarce, finding enough to eat must often be a day's work in itself.

It is chiefly by making food that plants serve the world. It is chiefly by what they eat, that birds are of service to other creatures. While it is true their appetites sometimes cause trouble and inconvenience to the farmers and fruit growers, the help they give is infinitely greater and more important than the damage that they do. The great majority of the smaller birds are insect eaters. In feeding themselves and their hungry families, they make way with an astonishing number of the insects, bugs and worms that feed on the farm-



ers' crops. Mr. Chickadee is one of these insect eaters. With his family of seven, eight and sometimes nine hungry babies, and his special taste for insect eggs, and for the cut-worms that make so much trouble in our gardens, he is indeed a useful fellow. Mr. Swift eats insects of a different kind, the kind that fly in swarms. He opens his big mouth as he circles through the air, and catches them on the wing. Our friend, the cardinal, eats many seeds, as his big beak shows us, but he is fond, too, of the boll weevil, the insect that gives the cotton growers so much trouble. He saves thousands of dollars worth of cotton every year by using the cotton fields for his hunting grounds.

Between them, the insect-eating birds divide their labors in behalf of their plant friends. Some care for the leaves and green stems only, and give their attention to the creatures that feed on them. Others eat the insects that hide under the bark of woody stems. The woodpeckers and nut-hatches are birds of this kind. Their strong, pointed bills can pierce the bark and find the insects hiding beneath it. Other birds find their dinners about the roots of plants, scratching away the earth and digging up the worms and other creatures hidden there. Many seed-eating birds keep weeds from spreading. Others carry seeds and drop them in distant places, where they spring up and make themselves at home. Sometimes this is a misfortune, but often it is a benefit. Many of the plants that grow on islands were carried there at first by birds. It is one of the chief ways in which islands lying far out in the ocean, have been made fertile and possible to live in.

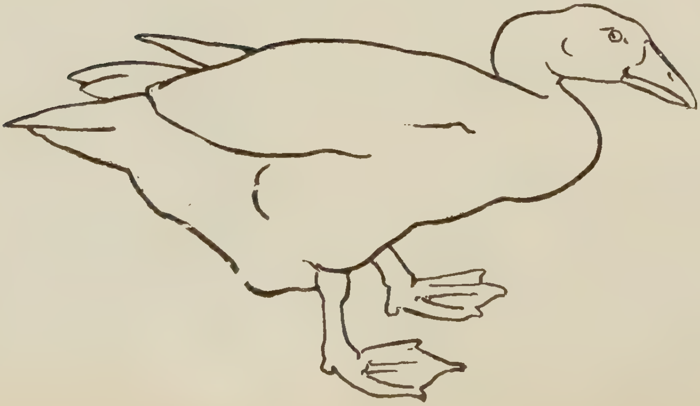
Some birds are carnivorous, like the eagle, who can carry off young lambs and kids in his huge claws. Owls and hawks prey on small animals like field mice, that do great harm to the crops. Indeed they are among the best bird friends the farmers have, although many people do not know it and believe they all rob chicken yards, because there are one or two varieties that do. Many of the larger birds are scavengers. That means they eat waste food, and carrion, the flesh of animals already killed. The sea gull is a useful scavenger in all places where there are large bodies of water. Vultures and buzzards do important work of this kind wherever they are found.

Of course it is not always possible to prove that a particular bird is useful to mankind. Nor is it necessary that we should. Birds lead brave, hard-working, joyous lives. They are their own excuse for being. If they did nothing more than charm us with their songs and their bright plumage, and astonish us by their flight, we would welcome them as neighbors.

The flight of birds, is after all, the most wonderful thing about them. The wisest people have never yet been able to find out just how birds fly. They can only tell us that they do it better and more easily than the best flying machines that men have ever made. How they find their way is another mystery. We know, however, that a carrier pigeon is trained by taking him just a little way from home, and letting him fly back again, then, on the next day, taking him a little farther off. And we suppose the big birds must teach their children the air routes that they need to travel.

Have you ever watched the flocks of wild geese flying, four miles high sometimes, on their way south, at the end of summer? Have you ever seen a colony

of bobolinks arrive on a May morning, singing their hearts out with joy at being home again? Do you ever think about the long journeys that such birds take? Like the men who travel in aeroplanes, they must see the country spread out like a great map below them. Perhaps they follow the lines of the rivers, shining-like silver threads in the sunlight. Some of them follow the shore lines of the ocean in the same way. Some, like the chimney swift, disappear altogether in the southland. No one knows just where they find a winter home. The bobolink, after putting on his brown winter dress, goes to the rice fields of the southern states. He makes himself fat on the good fare he finds there, and then takes a journey of several thousand miles to reach his winter quarters. In one part of his route he flies four hundred miles across the water without a single stop. As he reaches South America at the end of that long "lap," he is no longer the plump bird that set out from the rice fields. He is thin and tired, for he has used up nearly all the engine food stored in his little body. So he finishes his journey by slower stages, finding his winter home south of the Amazon and south of the Equator. When he comes back to us in the spring, he has put on his wedding dress of black and white. Many people do not know he is the same brown "rice bird" that troubles the farmers of the south. They call him "May bird" and "bobolink" in different parts of the country, and welcome him. For in the spring and early summer, he is a useful and tuneful citizen. At that time of year he lives entirely on



weed seeds and insects, as if to make amends for his costly eating habits of the fall. The sand-pipers of the Pacific Coast make a winter flight even longer than the bobolinks. Some of them go from Alaska all the way to Patagonia twice a year. Even the tiny humming bird makes a long flight to reach his winter home. Sometimes he travels from Hudson Bay as far south as Mexico, on his three-inch spread of wing. Hard work indeed, but what an ideal way to learn geography!

Unfortunately, like all wild creatures, birds have their enemies. Among them, the very worst of all sometimes, are thoughtless or ignorant human beings. But the more people know about birds, the more anxious they are to protect them. There are many ways in which we can help our bird neighbors, and encourage them to live with us in greater numbers. The first step is to make ourselves acquainted with them. The next, to find out about them, so that our well-meant efforts in their behalf shall not be mistaken ones.

Did you ever hear of a "bird sanctuary"? It is a place where birds can live, build their homes and find food, without fear of being disturbed. Every now and then we hear of some one who has given a piece of ground to be used in this way. Sometimes it is a beautiful park or a garden, sometimes a piece of woodland that they give to the birds. Always, I think, they plant it with trees and shrubs that keep their berries through the winter, and any sort of hunting is forbidden there.

We cannot all give "sanctuaries" to the birds, but

we can do other things to help them. We can refuse ever to buy or wear feathers and wings that have been taken from birds at the cost of their lives. We can feed them in the winter, and particularly in the early days of spring. For the birds who go south to find food through the cold weather often have a hard time when they first come back, especially if snow falls. Another important thing that we can do, is to keep our pet cats away from the nests in early summer, before the young birds have learned to fly. We can never teach pussy to leave the birds alone. It is her nature to prey on them, and we cannot change her nature. But when birds are nesting in the trees about our houses, we can try to keep her indoors and away from them. Some people make big outdoor cages of chicken wire, and let their cats take the air in them during the nesting season. This is a very good plan, one that does pussy no harm and protects the bird babies.

CHAPTER XVIII

Tree Friends

Have you tree friends, and can you tell them by their shapes? Or do you have to ask their names each time you meet them? We recognize our human friends at a glance, and can name them without stopping to think about it. Yet, I am sure you will agree that they are not nearly so different in their general outlines as the seven trees on Source Picture Number 18. So perhaps if we have trouble recognizing a tree, it is because we are not as well acquainted with it as we should be.

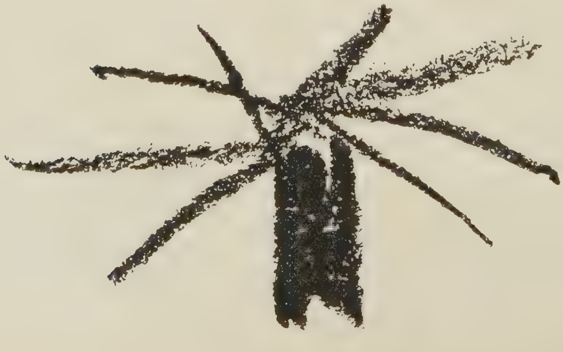
There are two sides to a friendship, and it is a fortunate thing for the whole world that the trees, on their side, are always ready to act as our friends, without waiting until we learn to do our part. To be sure, like the birds and the flowers, the trees befriend us just by living and growing, each in its own way. On our side, however, there has to be considerable learning and thinking done, before we can honestly call ourselves friends of the trees. No matter how much we may enjoy their grace and beauty, their color, their shade, their flowers and their fruits, unless we know enough about trees to make the most of their friendship, and to protect them from their enemies, we cannot hope to do our part.

Learning to know the trees, like learning to know the

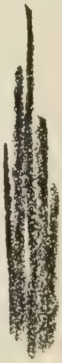
birds, is a delightful kind of learning. No one is too poor, or too busy, to undertake at least a little of it, and every bit of the knowledge that we gain about them, makes the world a more enjoyable and interesting place to live in. As with the birds, most of us at the beginning become greatly interested in identifying trees, at the same time we find it a pleasure to observe them as they keep their yearly calendar and change their dress with the changing seasons. Then when we ask ourselves the familiar questions as to "Where the children live," "What the children eat," and about what they wear, how they travel, the work they do, and the enemies from which they must protect themselves, we find there is a whole tree world, not very different from our own, or from that of the birds and animals.

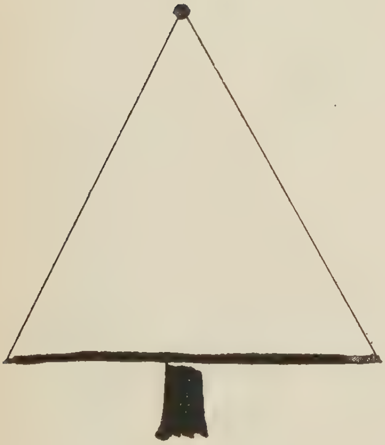
Can you identify the tree at the bottom of this page? It was drawn by a little boy named "Grady." He was half-past three years old when he drew it with his Hy-San Crayons. He made the trunk brown and the top green, just as they should be. It is a wonderful tree, and if you do not think so, it is because you do not know how much drawing a boy or girl of his age can be expected to do. But suppose you compare it with the one at the top of the page. That is the kind of tree many boys and girls draw when they are six years old, and in the first grade at school. If you remember that, when you look at Grady's tree, you will see why people think him an artist.

But it is not easy to identify Grady's tree. It has a trunk and a top, and we can guess from its shape,



that it may have been a Christmas tree. A Christmas tree is generally one of the first trees children try to draw. And in the beginning, if they can get the shape of the green top, and make a trunk of the right size, they can put such trees in pictures and make them look real enough for us to identify them. On page 246, you will see a very easy way to draw a tree of this kind. Begin with the trunk, then put a dot just above at the height you want to make your tree. Draw a line at the top of the trunk to give you the spread of the branches on each side, and map out the slanting lines that will make the sides of your tree. Then, with your green crayon draw lines back and forth from side to side as the picture shows. Another way to make a Christmas Tree is shown on page 247. This is a little harder, but makes a capital effect. The drawings on this page show you another simple way to make a tree that will look well in a picture. This one can be identified by its shape as a poplar tree. The green top is drawn first. With your crayon make the long straight line that gives you the height of the tree from the place where the branches begin to the very top of it. Make the lines on either side shorter and shorter each time. Last of all make the trunk with brown crayon. You can add very much to the effect of such a tree if you take a yellow crayon and go over one side of the green top with it. That will make it look as if the sun were shining here and there on the leaves. Then, on the opposite side, you can make shadows by going over it with a blue crayon and putting in little touches



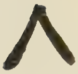


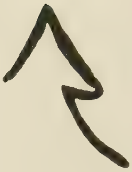
of brown or black perhaps, in some places. Try this on your drawing board and see how well this gives the effect we see so often—one side of the tree lighted up by sunshine and the other side in shadow.

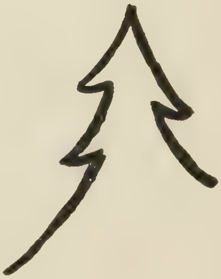
The trunk and branches together give a tree its shape. They make a framework for it very much as our bones make a framework that gives our bodies their shape. Or, perhaps it would be better to say that the trunk and branches are the real tree, and its green leaves are the dress that covers but does not hide the shape of it. If you look at the trees in the Source Picture you will see that this is true of all of them. In spite of the heavy masses of green leaves that each one carries, we feel the shape of the woody framework underneath. We call this the "structure" of the tree, and we can tell without a bit of trouble which ones have a tall, straight trunk running right to the top, and which ones have a trunk that ends in a few big branches, about where the leaves begin.

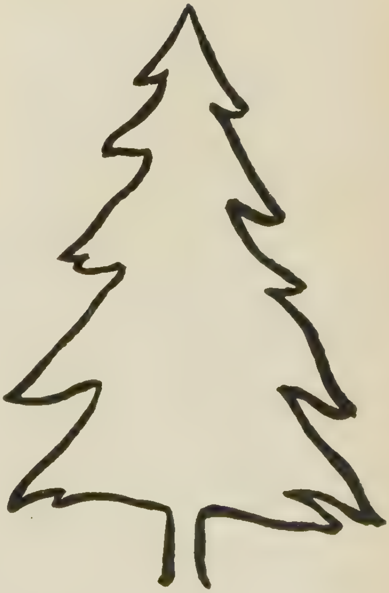
Little Grady could not make us feel this framework in his tree. He was too young to understand it. The drawings on pages 246, 247 and 248, too, show only the outlines of the trees they represent. But after a while we are not satisfied to make that kind of tree. We want to feel the structure underneath the leafy dress, and sometimes we want to show the tree as it looks in winter, without its leaves. Children who draw a tree like the one at the top of page 245, are thinking only of the framework, but they do not know how to make the trunk and branches look as if they belonged

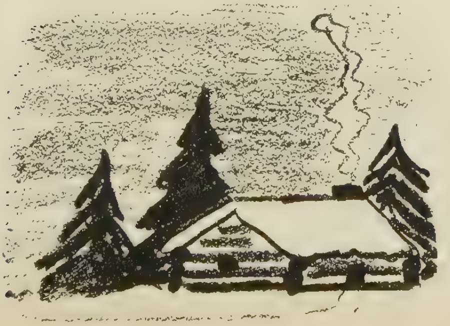
together. A very good way to do is to practice drawing the branches as if each one was growing out of the trunk, in the way that branches really do grow. First make the trunk. Then put in the lowest branch of the tree on, say, the right hand side. Begin at the lower right hand corner of the trunk and trace the outline with your crayon, carrying it on above the trunk and making the branch. Do the same on the left hand side. Now put in the big branches that come between in the same way, beginning each time at the base of the trunk. Make the smaller branches grow out from the big ones, just as you made the big ones grow from the trunk of the tree. In this way you can build a framework for your tree that will look as if every part of it belonged to the rest. This particular tree looks as if it might be an apple tree. The branches divide and slant in just about the way those of an apple tree do. But each kind of tree is put together in its own way. When we come to study them, we soon find the slant of the branches, and the way in which they divide into the boughs and twigs, is as different in different kinds of trees as the outline of their tops. Could you draw the poplar, the elm, the maple without their leaves? By thinking of them as they look in winter, and practicing a little, you can make very much such drawings of them as this one of the apple tree. The oak, with its horizontal boughs, and the willow, with its drooping ones, make an interesting contrast to the poplar and the elm. In any such drawings try only to show the most important lines, the trunk with its main branches









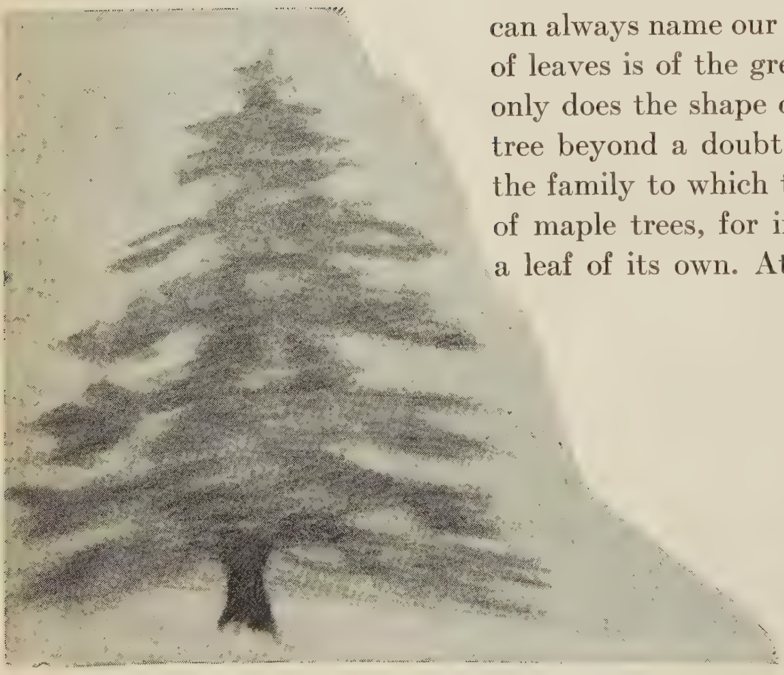


and perhaps a few smaller ones. But draw them always as they grow, the smaller from the larger ones.

The boy who drew the tree pictures on this page and 249, has learned to make his trees look real by very simple means. He has drawn the pine tree so that the foliage seems heavy. Yet we catch glimpses of the trunk beneath, and feel the structure of the tree. In the tree shown on page 249, he has made the branches seem to grow from the trunk and he has put on the leaves in such a way that the whole shape of the tree can be seen beneath them. This, as you know, is often true of a real tree. Not all have the dense foliage of the maple and the live oak. Many, especially in the spring of the year, seem very lightly clothed.

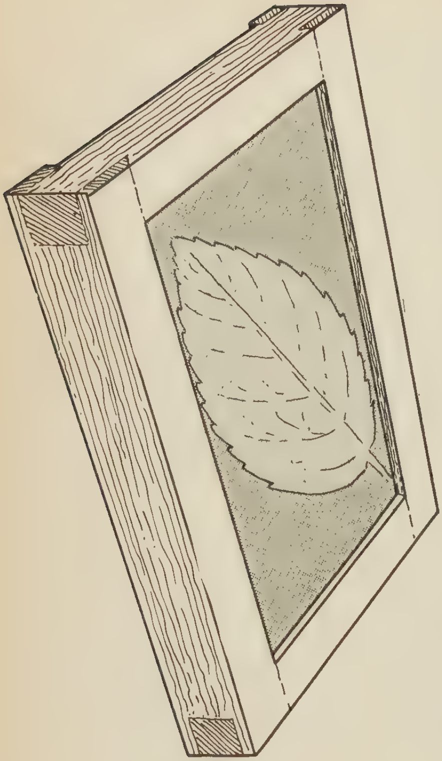
The structure of a tree as well as its outline helps us to identify it. Indeed, the names of our tree friends are revealed to us as clearly by their bare branches in winter, as by their foliage in summer. The bark of a tree is another means of identifying it. Some trees are easily told by their bark, the white birch, for example, the beech tree and the sycamore.

The final method of identifying a tree is by its leaf. When we are close enough to distinguish the leaf, we can always name our tree, and for this reason the study of leaves is of the greatest interest to tree lovers. Not only does the shape of the leaf tell us the name of the tree beyond a doubt, it tells us, too, something about the family to which the tree belongs. Take the family of maple trees, for instance. Each kind of maple has a leaf of its own. At the same time, all maple leaves



resemble each other. And this is true of the oak leaves. The leaf outlines shown on page 254, all belong to oak trees. Each, as you see is different. Yet all are more or less alike and bear a family resemblance. It is for this reason that so many people make collections of leaves.

The most common way of making such a collection is to press the leaves as we gather them, and then mount them in a scrap book, or on sheets of paper that can be kept in a portfolio. Leaves, like flowers, can be pressed between sheets of blotting paper, or the heavy felt paper that is put under carpets. Two or three thicknesses of newspaper will do very well. Spread each leaf flat on a layer of paper, and do not let them lap over each other. Whenever you can, use a twig with several leaves on it for your specimen instead of a single leaf. Put a second layer of paper over the first specimens, and arrange the next ones on that. When all your leaves have been taken care of in this way, put a board over the press and weight it down with something heavy. Have two sets of drying papers and change them every day or two, drying the ones you take out of the press each time. When the leaves are quite dry they are ready to be mounted. To hold them in place in your scrap book, or on the leaves for a portfolio, use little strips of gummed paper or court plaster. Each specimen should have its name written on the page, and people generally add the date when it was gathered, and the place where it was found. Some people make tracings of the leaf, and do not try to keep the leaf itself. The different outlines on pages 251 to 255 were



traced from the leaf. As you can see they make an interesting collection.

Even more interesting is a collection of blue prints. To be sure it costs a little more than the others, but if we have a little printing frame, such as people use for kodak pictures, and a supply of blue print paper, we can make beautiful leaf pictures. The leaf is placed in the frame under the glass, as if it were the film of a kodak. Then the blueprint paper is put in and the frame set in the sunlight to print. After a few minutes in the sunshine, the paper is taken out, washed in water, and dried. Then it can be mounted in a scrap book and will last for years. The shape of the leaf is clearly outlined, and the delicate veining in it shows as well. If you have never made blueprints, save your pennies, and get the paper and frame at a store where they keep photographic supplies. With such an outfit you can make wonderful flower pictures as well. The blossoms of some trees and even the fruit of a few, like the maple, can be blueprinted.

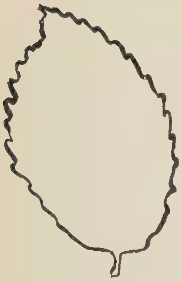
Nowadays many boys and girls do work of some kind through the summer vacation. Often they are asked to bring such work to school in the fall, and show their classmates and teachers what they have accomplished. A collection of leaves or of leaf pictures is a capital piece of vacation work. So is a tree scrap book, with pictures of the trees themselves in crayon, water color, or cut paper. In making such a book you might begin with a few pages showing your favorite trees. Or the seven trees on the Source Picture would make a good

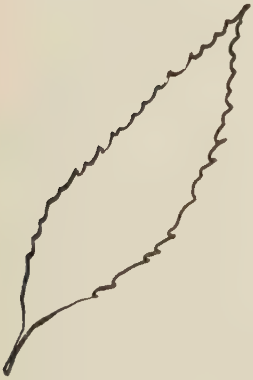
beginning. Then you could go on and add others that were new to you, perhaps, and so increase your tree acquaintance.

Do you know what a real naturalist would have in his tree book? He would have a picture of the tree, of course, showing its characteristic outline and structure. He might put in a picture of it as it looks in winter, too. He would surely show us its leaf, its flower, and its fruit or seed. And he would give its name and tell the tree family to which it belongs. He might give us an idea, too, of the places where it grows, or of the place where he saw it growing.

But you may think of other things to put in your tree book. You may be interested to write a story about trees, or to tell the history of some of them. Some trees have come to our country from far away places. The apple tree, for instance, was brought to America from Europe by the white settlers when they came to make their homes here. Did you ever hear the story of "Johnny Appleseed," the curious man who spent his life planting apple trees so that settlers who came to make their homes in some of our western states might find apples to eat? The beautiful ginkgo tree that is now planted in many of our city streets and the ailanthus tree that can live in city yards where other trees would die, have come to us from Japan and China, and yet we sometimes think trees cannot travel!

You may be interested to copy poems or quotations in your tree book. Many beautiful things have been written about trees, for poets and writers, like artists,

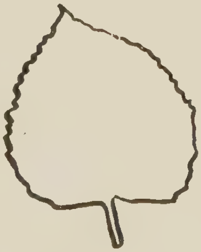


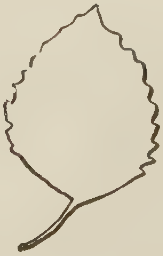


have always enjoyed and admired them. Perhaps you can write some poems of your own about the different trees you choose for your book, or the life story of the tree from the time it began as a seed in the ground.

Conventionalized tree pictures are often used in posters and for decorations. Leaves and fruit make capital design units and very useful ones. Across the top of the Source Picture you will see some border patterns with units made of the leaves and seed pods, cones and fruit, that belong in each case to the tree just below. In the spaces at the bottom where the names are printed, are some tree symbols. They are very much like those the Indians draw on their wigwams and canoes, or weave into their blankets or baskets. They were worked out on squared paper like that used for drawing the last alphabet in the chapter on Lettering (page 184). An easier way would be to use squares of stiff paper cut to fit a checker board. With such a set of squares you could work out some tree symbols of your own. Begin with a Christmas Tree. Make the trunk first, and then begin at the top and work downwards. When you get it planned, rule off some squares on your drawing board, or on paper. Copy your pattern, filling in each square with green crayon. Then put some red candles on it and perhaps a star at the top. You will soon find that other tree symbols suggest themselves to you, and that working with squares in this way is a capital way of inventing design units.

Just as our public libraries and book stores are well





supplied with bird books nowadays, so we can count on them to furnish us with many interesting and informing books about trees. Whatever we wish to know about a special kind of tree or about trees in general, we can find out with very little trouble. We must depend on ourselves, however, if we would observe trees, and enjoy the pleasure that comes from seeing them in sun and shadow as they undergo the changes that mark their yearly calendar. In winter our friends the trees are sleeping, so far as trees may be said to sleep. As they waken in the spring and the sap beings to run, faint colors paint their twigs and branches—rosy pink, and yellow, and violet. Soon they begin to show the green of their budding leaves. Then comes a time when every tree on the hillside wears its own particular shade of green, standing out distinct and different from the rest. But as warm suns begin to shine, these young greens deepen and blend into a solid mass of summer foliage, with only here and there an evergreen, or a copper beech, perhaps, to break their ranks. Then comes the harvest season with the yellows, reds, and russets that Jack Frost paints, and last of all the grays, and blues, and browns of winter, with now and then a dazzling party dress of ice and snow.

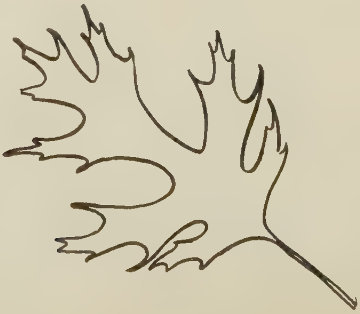
While all of us enjoy the blossoming of the orchard trees, many people know little or nothing of the modest flowers that make the seeds for trees as mighty as the White Oak and the Red Maple. Every tree, however, cares for its tree children, and scatters its seeds in one way or another. Like the plants in the garden a tree's

food and drink are air, water, and the coarse materials of the soil in which it grows. The spread of a tree's roots underground are about the same as the spread of its branches overhead. Its leaves, lifted to the sun, take in the food stuffs from the air and change them, as well as the watery, earthy fare from the ground, into sap. This, carried back into the branches, trunk and roots, builds up the woody fibre of the tree as well as its new shoots, its buds and flowers.

Did you ever notice the top of a tree stump, and try to count the little rings in it? They cover the whole surface, one inside the other, and if we do count them, they will tell us the age of the tree. The tiny center ring was made the first year of the tree's life, the next was added in the second year, the next one in the third. Only the part of the tree trunk next underneath the bark, can be said to be alive and growing. It is through this part that the sap flows, up and down the tree, and here the new woody ring for this year's growth is being added.

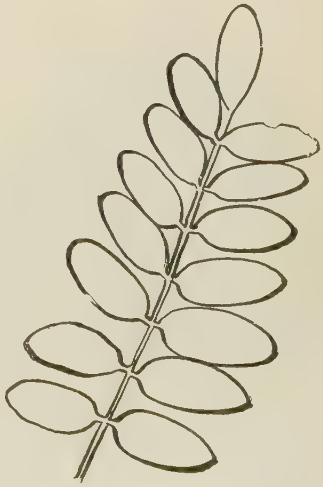
This is the reason it is possible for a hollow tree to live and grow, and why a tree that is "girdled," by having its bark cut away all the way around its trunk, will die. Thoughtless people who strip the white bark from helpless birches do not know this, or else do not care if they kill the tree.

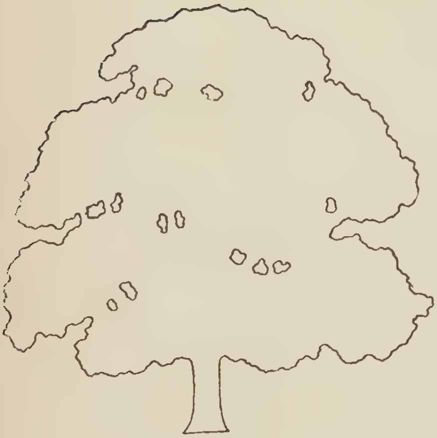
Do you know how long a tree can live? Some of the giant Sequoias, the "big trees" of California, are three hundred feet in height and thirty feet around the trunk,



and are believed to be as much as four thousand years old. In Mexico there is a group of Cypress trees said to be far older still, perhaps six thousand years old. If so, they must be the very oldest living things in the world. Even a tree of very modest size may be a good deal older than you or I. It takes from 50 to 70 years for a tree to reach a size where it will be useful as lumber. Douglas firs, like the one on the Source Picture, must be even older, before they can grow tall enough to be used for the masts of big sailing ships, as so many of them are.

Not until we try to count the numberless useful and necessary things that come to us from trees, can we realize how important they are to the work and welfare of the world. It is not alone the use of trees as lumber for making our houses, furniture, ships, railroad ties, telegraph poles and things of that sort, that we must count. It is not enough to think of trees as fuel for our fires, in the form of coal and petroleum, as well as of charcoal and firewood. We must remember that most of the paper we use is made from trees—that all of our rubber, turpentine, rosin, as well as maple sugar, come from their sap. In addition to the delicious fruits and nourishing nuts that are the seeds and seed coverings of many trees, the oils made from the olive and the cocoanut, are important all over the world. Medicines, dyes and spices come to us from the bark and leaves of trees. In the countries where they grow, the different kinds of palm trees supply the simple native people with almost every thing they need. They





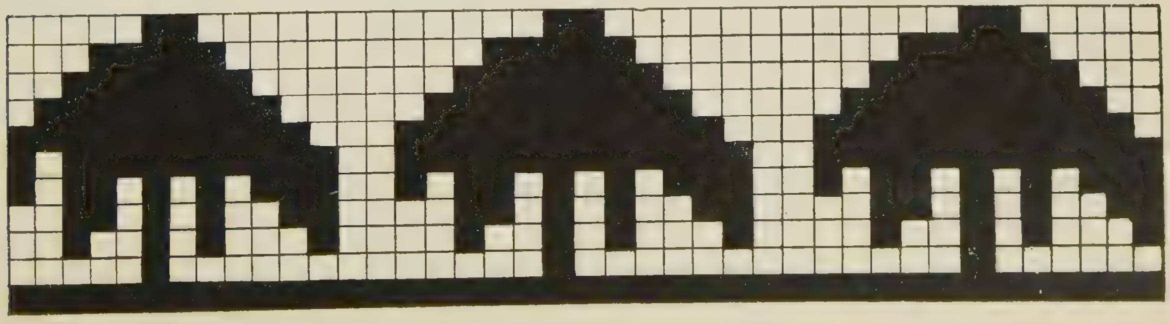
give materials for food and shelter, for clothing and for weapons of defense. At the same time they furnish them with products they can sell to us, like dates, and oil, and the raw materials for chocolate and cocoa.

But long as we may make a list of this kind, it will never cover what is perhaps the greatest service that our tree friends render us. Trees have an important effect on the climate and soil of places where they grow. They drain the ground of its moisture, holding the rain water in their spreading roots below the earth as well as in their leaves and branches. Then, little by little they breathe it out into the air again through their green leaves. Did you ever walk through city streets on a hot summer evening and reach a big tree-filled park? If so you must have noticed how much cooler and damper the air of the park seems by contrast. In many places when forests have been cut down, serious floods come after heavy rains, because there are no trees to drink up the water in the ground and it drains off quickly into the rivers. Then in dry seasons there is no more water left in the ground, and wells and streams run dry. In some of the old countries of the world the climate has been quite changed, and the soil from the farmers' fields almost entirely washed away, because, once upon a time, ignorant people cut down the trees faster than they could grow again. In other countries people have been wiser and have studied how to take care of their trees, and especially of their forests. In those countries the forests are like beautiful parks. They are carefully watched and protected.

No tree can be cut down until it has reached a certain size, and another is always planted again in its place. A *forester* is the name given to a man who studies the care of forests, and how to preserve them. His work is to see that there shall always be a supply of trees for lumber, but at the same time he is working to protect the climate and soil of the country.

In America, unfortunately, people have not been very wise about caring for their trees. A most important thing that patriotic people have to do today, is to save the forests that are still left, and to take care of them. It is to remind us of this that Arbor Day is set aside in the different states. Some states have two in the year, one in the spring and another in the fall. Arbor Day is really "tree planting day," but it is also a day to remind us of the protection that our tree friends need. In some states it is also "Bird Day" and this is a splendid idea, for whether *we* are worthy to be counted as friends of the trees, our Bird Neighbors certainly are.

In a year's time two billion dollars worth of lumber is cut in our country; twelve million dollars worth of trees are lost by insects, tree diseases and windfall; four million dollars worth are destroyed by fire. So you see we need to plant wisely and to think of our trees as one of the most important of all crops. There is yet much that people need to learn about the burrowing and leaf eating insects that destroy so many trees. One-fifth of the forest fires are caused by lightning, but four-fifths by human carelessness—by matches, cigars,



neglected camp fires and train sparks. Our government is doing more and more to protect the forests from fire. Men called *"forest rangers"* make it their business to watch for them and put them out when they first start, if possible. Look-out towers, aeroplanes, telephones and radio help to make such work easier and more effective year by year.

The boys and girls of today must be the guardians of the nation's trees tomorrow. They will do their work better and more wisely if they begin by learning to know and to love their Tree Friends.

In the parks of Spain, we often see this notice posted,—

TO THE WAYFARER

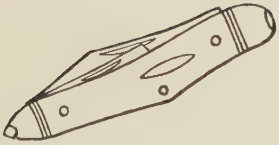
"Ye who pass by, and would raise your hand against me, harken ere ye harm me!
I am the heat of your hearth on the cold winter nights;
I am the friendly shade that screens you from the summer sun.
My fruits are refreshing draughts, quenching your thirst as you journey on.
I am the beam that holds your house, the board of your table, the bed on which you lie, and the timber that builds your boat.
I am the handle of your hoe, the door of your homestead, the wood of your cradle, and the shell of your coffin.
Ye who pass by, listen to my prayer,
Harm me not!"

CHAPTER XIX

With Hammer and Saw

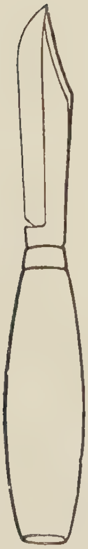
Donald is a boy who loves to work with tools. On Source Picture Number 19 you will see him using his coping saw. He has a sawing board clamped to the edge of his Hy-San Table. That makes a little shelf on which to rest the piece of wood that he is cutting, and at the same time gives an opening through which the saw can be used as he works it up and down through the wood. Just below his picture there is a picture of the coping saw, and on the right of it a picture of the sawing board. On page 262 you will see the clamp and the way he clamps the sawing board to the table when he needs to use it. The different patterns and models on the Source Picture show you some of the things he has made with his outfit of tools.

Nearly all boys and girls like to make things of wood, but many of them think they cannot get the necessary tools to do such work at home. They have an idea they need a whole carpenter's bench and all the different things that go with it, just as they see them in the school shop, or perhaps in the home of some friend who has been presented with a complete outfit of that kind. A carpenter's bench with tools of different sorts and sizes is indeed a wonderful thing to



have in one's home. Boys and girls are very lucky if they can have such an equipment to work with. But a great deal can be done with a much simpler outfit, and, after all, it is what you *do* with the tools that counts.

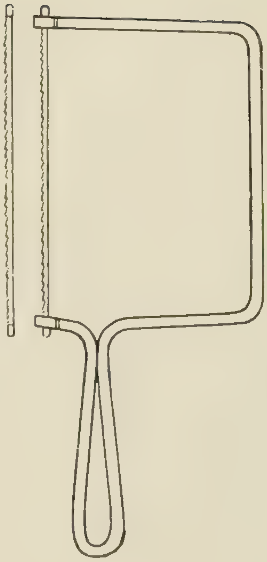
That is what is interesting about Donald and his tools. He has only a few, but they are the most useful ones that anyone can have, who is just beginning to work with wood. Donald bought every one of them himself with money that he earned in one way or another. Of course he had to get them one at a time, and sometimes he had to wait awhile before he could save enough pennies to buy the next thing, but that is not such a bad way to do. You are pretty sure to know just what it is that you want, when you buy things in that way.



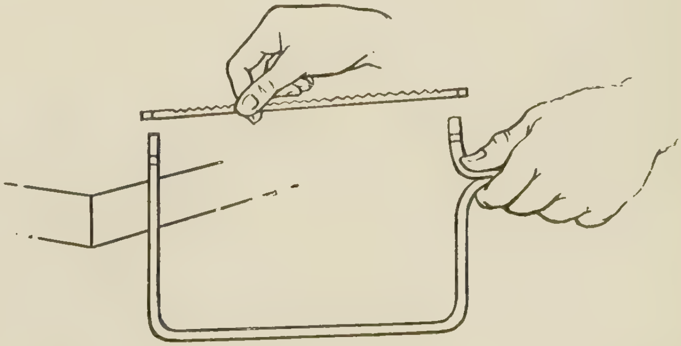
The first thing that Don bought himself was a hammer. Not a very large one, but one with a head that looks really business-like, as if it were meant to drive the nails "home" and not just to be played with. Then he got a knife. That cost more than any of his other tools but he knew it was worth while to have a good one. Indeed some people say very truly that "a knife, a boy, and a piece of thin soft wood, make the very best working outfit to be had."

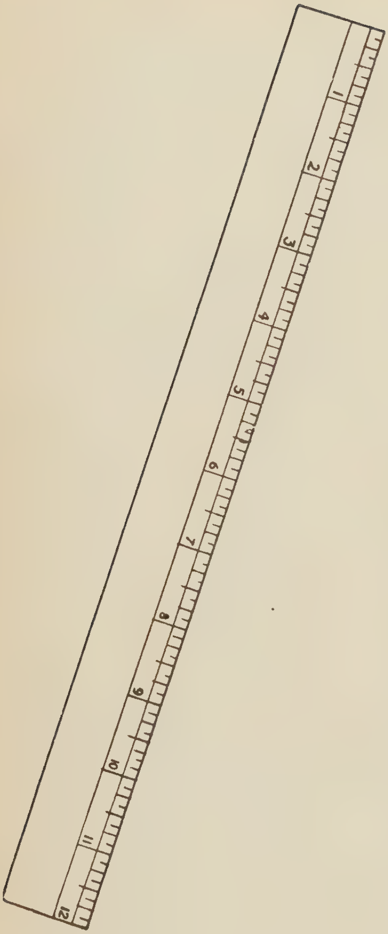
At the side of the page you will see a picture of Don's knife. It is a jack-knife with three blades. The big one is very thick and strong. Just below it you will see a picture of a "Sloyd knife" that costs very

much less and is often used by carpenters. Donald knew a sloyd knife would do for his kit, but he also knew the jack-knife could be used in many more ways. Then, too, he could carry it in his pocket.

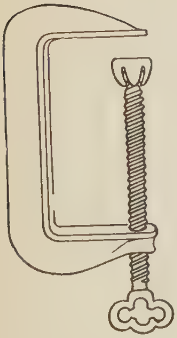


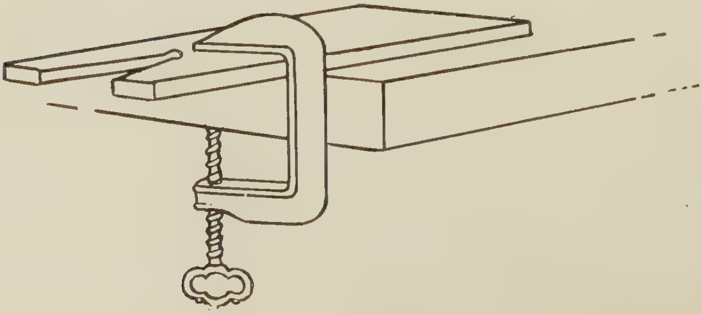
The next thing Donald bought was his coping saw. The frame cost only a few cents and the blades a few cents more. The blade of the coping saw is a narrow strip of steel with tiny slanting teeth along one edge. There is a drawing of the sharp toothed edge on the Source Picture just below the saw itself. The blades come in different sizes. They are slipped into notches in the saw frame and can be easily taken out and changed. Donald found it a good plan to depend on the coarser sizes at first, for the finer ones are easily broken when you are just learning how to handle the tool. When a blade is put into the frame the toothed edge must face outward, as you see in the picture, and the points must slant toward the handle. The end nearest the handle is slipped into its notch first, then the upper end of the frame is pulled toward the handle until the blade can be slipped into the notch at that end. As the frame springs back into place the blade is held tight, ready for business. The saw should be held as you see Donald holding it, and worked up and down through the wood. It is important to keep it vertical as you work, so as not to slant the edge you are cutting. You can see by the picture how Donald holds and turns his piece of wood with his left hand. He rests the thin piece of wood that he is cutting on his sawing board.





This little sawing board, or "saw-jack" as some people call it, was the very first thing that Don made with his coping saw. But before he could make it, he found he must have a ruler and a small piece of soft pine board, as well as a pencil and the iron clamp. The board was given him by his friend, Mr. Sands. Mr. Sands is a carpenter who has a shop around the corner from Donald's house, and he often advises Don about his work. Sometimes he shows him just how a thing ought to be made, and sometimes he says, "You had better experiment with that yourself." He told Don the sawing board ought to be made from wood ¾ of an inch thick, and that the opening should be 3 inches wide at the end and about 4 inches long. The exact size of the board was not so important he said. Some people like them wider, and some like them longer than others. Don made his 6 inches wide, and 9 or 10 inches long. With his ruler and pencil he measured and drew the lines for the opening at the end. To make the round notch he laid a silver quarter on the board and drew around it. Then he put a folded newspaper on the top of his Hy-San Table, clamped the board to the edge of it as the picture shows, and cut out the wedge-shaped opening, following the pencil lines with his saw. He found it hard work cutting through wood of this thickness, and he broke a few saw blades before he learned by experience just how to manage his new tool, and how

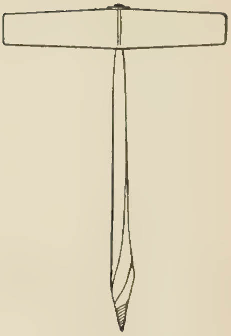


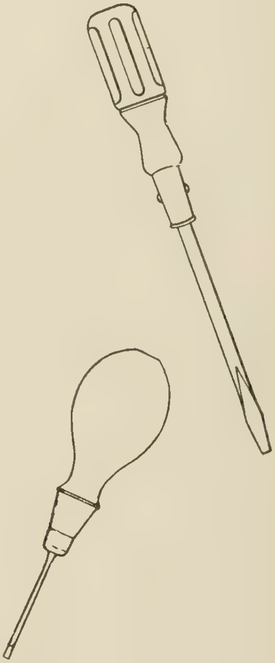


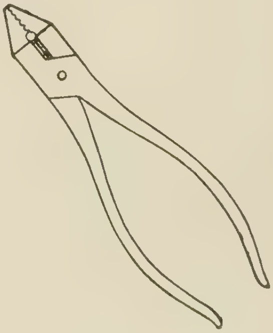
much strain the little piece of steel would stand. But after the sawing board was finished, and he could begin making things from thinner pieces of wood, he had better luck.

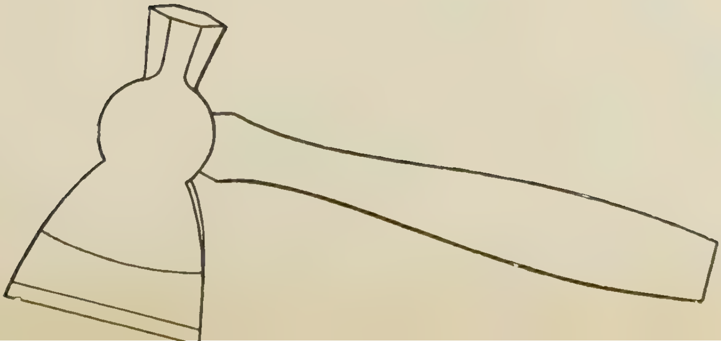
Donald finds his Hy-San Table just the thing to use, and by putting folded newspapers over it, or a thick piece of oilcloth, he can protect it from scratches. Of course there is always danger of marring a piece of polished furniture when you do work of this kind, and if you can get an old table of some sort, or buy a cheap kitchen table to use as a "bench," it would be a good plan. However, there is this advantage in using the Hy-San Table, it can be raised or lowered to suit the person who works at it. A table or bench that is just the right height always helps you to work better.

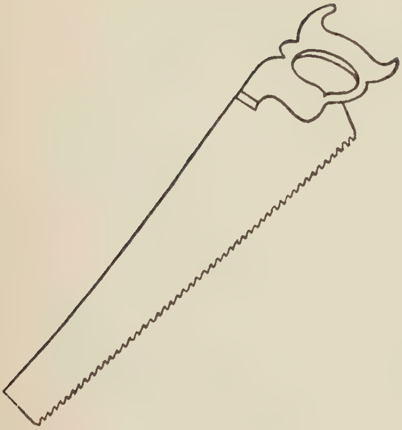
The other tools that Donald has in his kit are these, —a hatchet, a screwdriver, a gimlet and an awl for making holes, a pair of pliers, and a sandpaper rasp. He is saving now to get himself a saw. Mr. Sands says a short cross-cut saw is the right kind for the sort of work he wants to do. The blade should be short, not more than 18 or 20 inches long with 9 points or teeth to the inch. Blades for hand saws come in sizes ranging from 16 to 28 inches long. Those with the shorter blades are often called "panel saws." The number of points or teeth to the inch varies from 5 to 11 according to the kind of work to be done. The teeth for a cross-cut saw slant on both the front and back edges





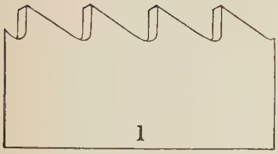




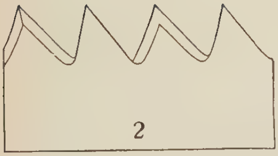


as the picture (No. 2) on this page shows. They are meant for cutting across the grain of the wood.

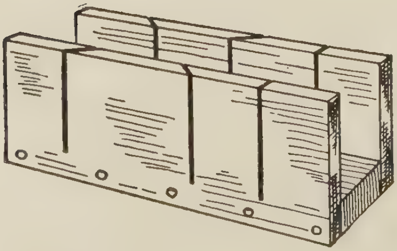
The grain in wood always lies the long way of the board. And boards, of course, have always been cut the long way of the tree. When a tree is growing its strong fibres are the up and down fibres. Those that hold them together and run from side to side of the trunk are much weaker. That is why wood splits so easily along its length or "with the grain" as people say. It is also the reason why it is hard to cut "across the grain," and why carpenters use two kinds of saws, the cross-cut saw for cutting across, and the rip-saw for "ripping" or cutting with the grain.



The teeth of a rip-saw are cut always with a straight front edge as the picture (No. 1) shows. They have fewer points, generally 5 or 6 to the inch. A 6 point rip-saw is the best for a boy to use. Some day Don is going to have both kinds, but he needs the cross-cut saw most. He finds he can generally split a piece of wood lengthwise. If it is thick, he uses his hatchet for splitting it. Thin wood can be split with the big blade of his jack-knife.



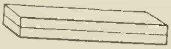
Besides the saw, Donald has a number of other tools on the list of things he means to get. He intends to have a try-square, a smooth plane, a brace and set of auger bits, a coarse metal file of the kind called a "wood rasp," and some chisels of different sizes. He must have an oil-stone and an oil-can, too, for he has

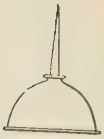


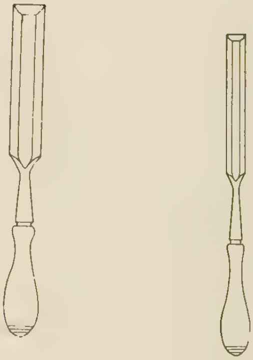
to use oil on his tools, and wipe them carefully with an oiled rag from time to time to keep them from rusting. Donald burns his rags each time after he has used them, for he knows oiled rags are dangerous to leave around. They seem to start fires all by themselves sometimes.

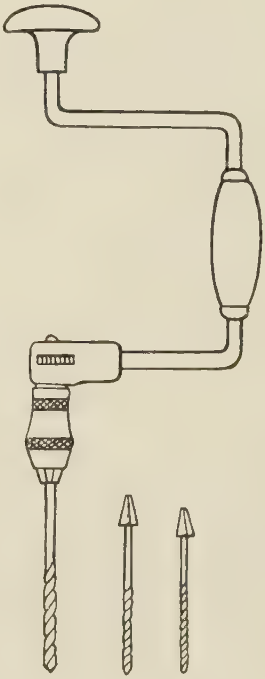
Just as soon as he gets his cross-cut saw Don intends to make a miter box to use with it. He will make that of three pieces of thick board put together as the picture shows, and Mr. Sands has promised to make the "cuts" in it. It will have one running straight across, to guide the saw when you are cutting a strip of wood at right angles. Mr. Sands calls that a "ninety degree cut." In addition there will be two "miter cuts" to guide the saw when you need to slant the end of strips to make frames with mitered corners, like those of a picture frame. These cuts are called "forty-five degree cuts."

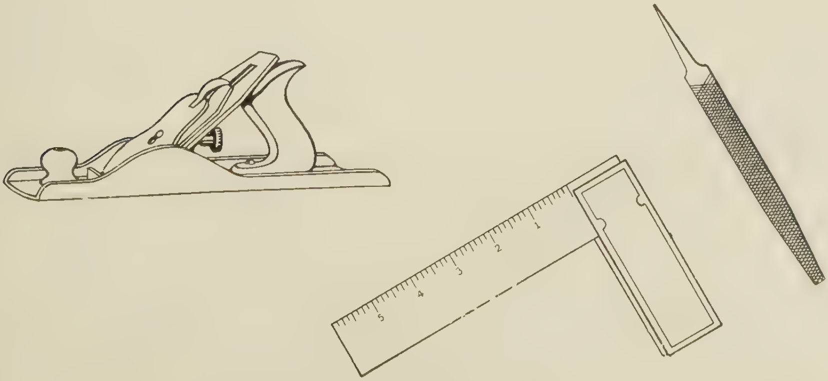
Of course Donald does not always buy the wood he uses. Packing boxes like those from which John and Mary made the house "Where the Children Live" can always be knocked down into boards that make good material for many things. The wood of cigar boxes is good too, especially for doll furniture, and such things as broom handles and old curtain poles are useful in many ways. But it is a fine thing to know something about the wood that carpenters use, and the different sizes and thicknesses in which it comes. Sometimes it



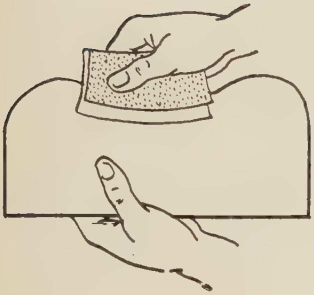






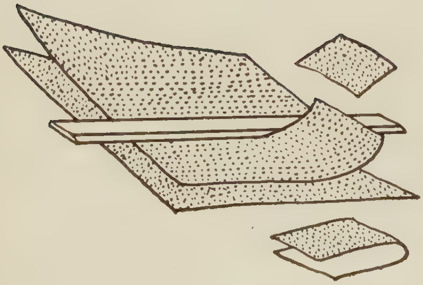


is a great help to be able to get just a little for some special thing you wish to make, as the sawing board for example. When Don was first beginning to use his tools, Mr. Sands explained to him how important it is for boys and girls to choose *soft* wood for their work, as they are not strong enough or skilled enough to work with hard wood. "Soft pine is the thing to ask for," he said, "although the stock carpenters call 'pine,' often comes from different kinds of trees. Poplar, cypress, basswood, and redwood are all woods that are easily worked."



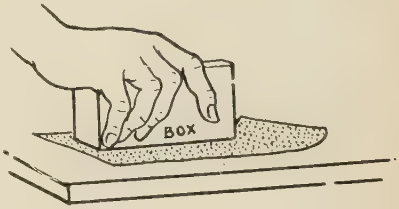
Boards come in different thicknesses and are sold by the "board foot." A board foot is supposed to be 1 inch thick and 12 inches wide, as well as 12 inches long. Thinner stock is more useful for a beginner, and easier to handle with the coping saw. Don uses some boards ¼ of an inch thick. He has found that ⅜, ½ and ⅞ of an inch are all good thicknesses for the things he needs to make.

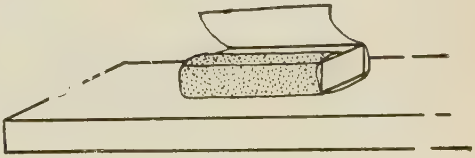
Besides boards there are the "stock strips" as Mr. Sands calls them. These come in different widths and thicknesses and are very useful for many things. On page 62 where you read about the blocks that were used for the block toys on Source Picture Number 5, the stock strips called two-by-fours are described. Their name means 2-by-4 inches, but they are not quite as big as their name would lead you to suppose. They come generally about 3¾ inches wide and 1¾



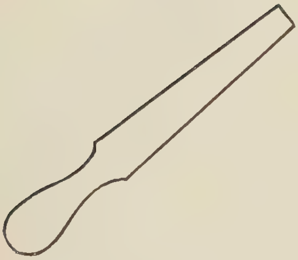
inches thick. Two-by-fours are sold by the board foot and make splendid building blocks when the carpenter cuts them for you in the lengths you need. But they are too big and thick to try cutting with a coping saw. You might find, though, that the one-by-two strips are not too heavy. These are about ⅞ inch thick and 1¾ inches wide. They are known as "furring strips." Still smaller are the one-by-one strips called "plaster grounds." These can be easily handled with a coping saw. The little blocks that John and Mary used for the house "Where the Children Live" were cut from stock of this kind. To make them it was only necessary to measure off the length of each block on the strip, mark it in pencil and then cut it across. With a cross-cut saw and a miter box, it is easy to cut off small blocks from the plaster grounds for oneself. They will not be as satisfactory, to be sure, as those a carpenter would cut. They should answer pretty well for making doll furniture. You might even cut them successfully with a coping saw if they are to be used in that way. Building blocks, however, need to be cut very carefully so that the ends shall be exactly straight. For that reason, it is usually best to get a real carpenter to cut and smooth them for you. The smaller stock strips are all sold by lengths, the "linear" foot, instead of the board foot.

Another kind of stock that carpenters use is the doweling that has been described in one or two earlier

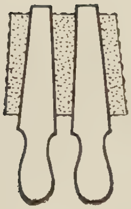


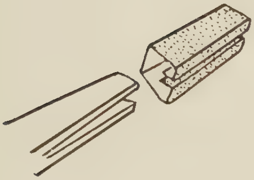


chapters. "Dowel sticks" are sold by the linear foot in 1-inch, ³⁄₁₆-inch, ¼-inch, ¹⁄₁₆-inch, ⅜-inch and larger sticks, according to their thickness or "*diameter*" as Mr. Sands calls it.

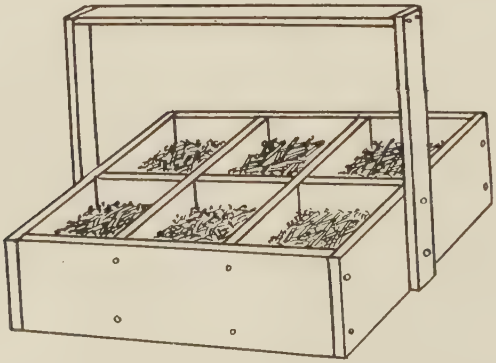


When Donald had cut out his sawing board, Mr Sands showed him how to smooth it with sandpaper. This he called "sanding." Donald smoothes everything he makes with sandpaper. That gives it a nice finish and makes it possible to paint or stain it evenly afterwards. Sandpaper comes in sheets. Some grades are coarse and some fine. Number 00 grade is very fine, Number 0 is fine, Number 1 is coarse, and Number 2 is very coarse. Donald generally asks for Number 1½ or Number 2. He can often buy small sheets of it in packages at the ten-cent store. He generally lays his ruler on it and tears off a small piece that he folds with the rough side out, and rubs with his thumb over the surface that needs finishing. Sometimes if the thing to be sanded is small, he lays it on the sandpaper sheet and rubs it back and forth across the paper. Or, if he has to finish a big flat surface, he often wraps the sandpaper around a block of wood and uses that to rub with. Sometimes when he is trying to even a curved edge he wraps the sandpaper around a stick.

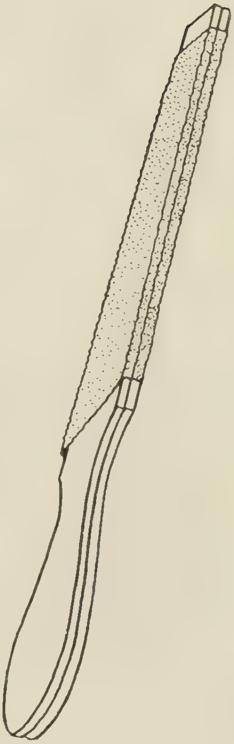




Don has a sandpaper rasp, too, that Mr. Sands showed him how to make for finishing edges. The pictures show you the pattern. Two pieces of wood, 12 inches long and about the thickness of a lath, were

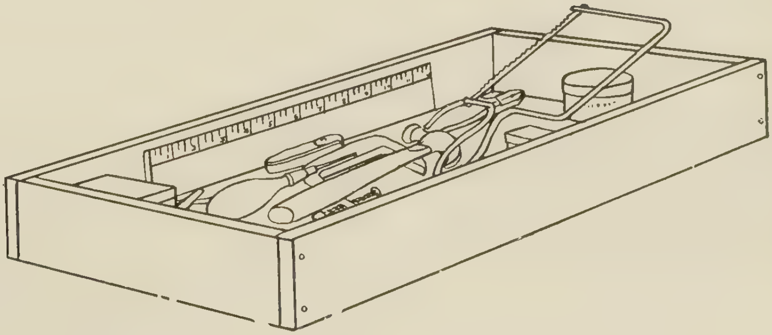


cut in the shape you see. The rasp is 1½ inches wide at the end and 3 inches wide at the widest part of its blade and through the handle. The two pieces are laid on the sandpaper which is then folded around them as the picture shows. Then the two blades are put together with brads nailed through the ends and through the handles, but not through the sandpaper.



By the time Don had finished his rasp he began to realize he must have a box, or at least a tray to keep his tools in—so he made the one you see in the picture on this page, and used some boards from a packing box for it. He made it 14 inches long and 7 inches wide. The sides were only 2 inches deep. He felt sure he could find the tool he needed more easily in a shallow tray than in a deep one.

Then he made a nail box, one that could be put right into the tray with the rest of the outfit. There is a picture of it and of the tray. The box has 6 compartments for different kinds of nails and is 5 inches long and 3½ inches wide. In one compartment Don keeps a few common nails of the regular 6 and 8-penny sizes. But for toys, and for nearly all the things that he is most anxious to make, the thin "finishing nails" and "brads" are the things to use. They have small heads that can be sunk into the wood, and hardly show after you have driven them "home." The finishing nails come in the same lengths as common nails and are called by the same names. A "4-penny nail"



is 1½ inches long, a "six-penny nail" is 2 inches long, and an "8-penny nail," 2½ inches long. The brads are 1-inch long or shorter and are called "inch brads," "½-inch brads," "¾-inch brads," according to their size.

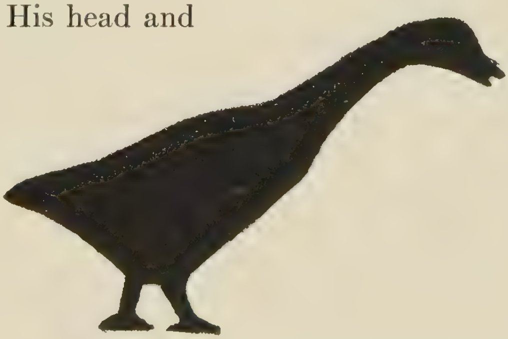
Do you know that you can drive nails more easily if you "soap" the ends, by sticking them into a piece of soap first? Donald has found there is less danger of splitting the wood, too, when he uses soap. In small pieces of wood he often starts the nail holes with his bradawl before he cuts out the part he is making. That helps him to keep from splitting it when he drives the nail later.

But I know you must be anxious to hear about the toys Don makes, and especially about the horse at the left side of the Source Picture. Donald generally makes his toy animals from thin board. He likes it about ⅜-inch thick for toy making. Sometimes he uses the wood from cigar boxes, but what he likes best is a smooth white board on which he can draw his outline easily. When he is inventing a new design he generally works it out on his drawing board first. He has found he can use the Source Pictures of the Children's Pets, and of the Farm and Zoo Animals for patterns, and has made a good many of that sort already. He finds it a good plan to conventionalize the shapes for his toy patterns. That gives them straighter outlines, and makes them easier to cut. After

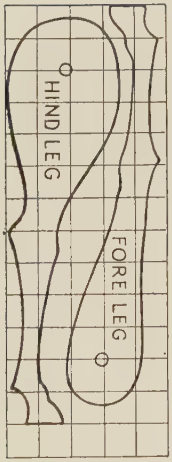
he has an animal cut out, he evens the edges very carefully with his sandpaper rasp, and sandpapers the sides until they are nice and smooth. Then generally he nails them to a flat strip of wood so they will stand up. He calls this a "base." Sometimes he makes wheels for the base or uses button molds for wheels. Then he paints the animals with his Hy-San Colors and sometimes he adds a coat of varnish as a finish.

Sawing to a line is something one has to learn by doing it, and cutting out toys gives one lots of good practice handling a coping saw. It is hard in the beginning to keep your saw straight and always make a vertical cut through the wood. But slanting edges, of course, will spoil the appearance of your toy. Sometimes, in following the curves of a pattern, Donald finds the frame of the saw getting in his way, so that he cannot go any farther in the direction he needs to cut. When that happens he has to change the position of the saw blade. He slips it into another pair of notches in the frame. These hold it so the toothed edge faces to the side instead of the front. He uses it in this way until he has passed that part of the curve, when he puts it back into its right place again. Sometimes he has to change the blade in this way several times while cutting out a single animal.

The pattern of the horse on the Source Picture differs from the animal toys that Don cut at first. He is made of separate parts bolted together. His head and

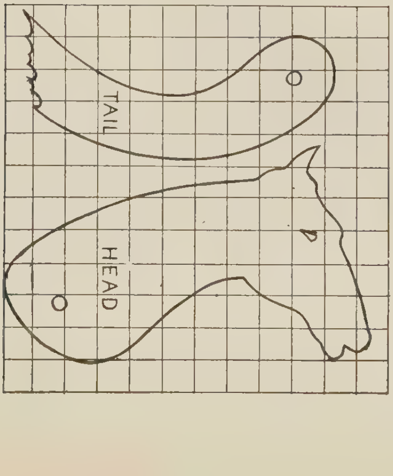


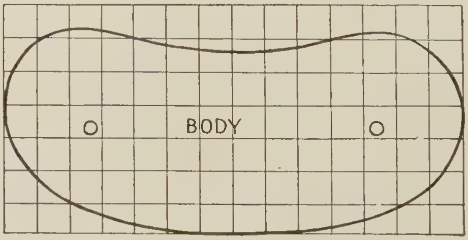
his tail are made of wood considerably thicker than the rest of him as you can see by the funny looking drawing marked "End View." The wide center section represents the thickness of the head and tail parts, next which the thin sides or "body" pieces are placed with the thin leg pieces outside, and the bolt run through to hold them all together. This gives the horse a width that makes him look more real in some ways, and also makes it possible for him to stand up firmly on his four feet, and take the various positions that you naturally want a horse to take. He can stand, walk, run, eat grass, switch flies, kick, pull, balk, stand with his back to the wind,—in fact he is a very accomplished animal. That is why he was chosen for our Source Picture.



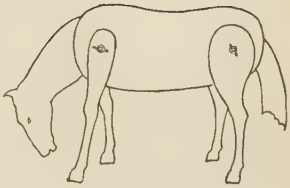
Chapter XIII told how letters can be drawn on squared paper. As you will see the pattern of Donald's horse has been drawn on squared paper. That makes it easy for you to copy him in any size you may wish to make him. Rule off the squares in pencil on your board, making them larger or smaller as you like. Then using them to guide you, draw the outlines of the different parts. You can make the horse larger, of course, or smaller by making larger or smaller squares. The pattern on this page drawn on ½ inch squares makes a horse about 13 inches long and 6½ inches high.

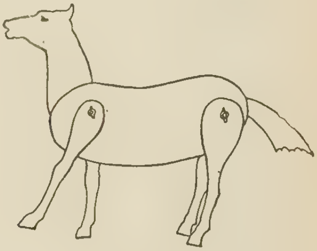
Mr. Sands showed Donald how to lay out a pattern



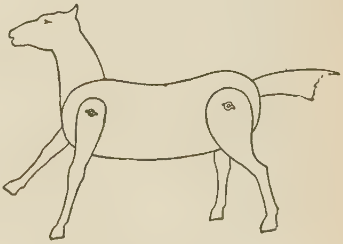


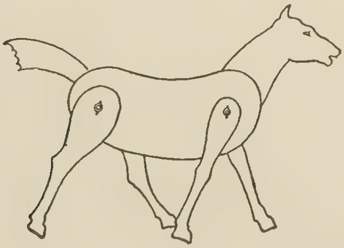
in squares. He warned him too, to remember about the grain of the wood and always to arrange his pattern so that thin pieces, like the legs of an animal, would be cut with the grain. That makes them as strong as possible. The cheap wooden toys in stores are often cut without regard for the grain of the wood. That is one reason why they break so easily. Sometimes carpenters use very thin wood glued together in layers, with the grain running lengthwise in one layer and crosswise in another. This is called 2-ply and 3-ply stock according to the number of layers. It is very strong and does not split when used in thin strips. Donald has tried gluing layers of cigar box wood together in that way and finds he can use it very nicely sometimes for the legs of animals, and for the legs of toy furniture and things of that sort.





As you will see, the pattern of Don's horse is laid out on the squared paper so that the legs lie the long way of the board and can be cut with the grain. It is not necessary to cut the head and tail of thicker wood unless you choose to do so. The horse stands more securely and is more real looking if the thick pieces are used, but of course, it is much harder to cut them. You could, however, cut two heads and two tails the same thickness as the sides and legs, and then glue them together. This would be a little more trouble, and you would have to even the edges carefully afterwards, but the horse will be a much better and more

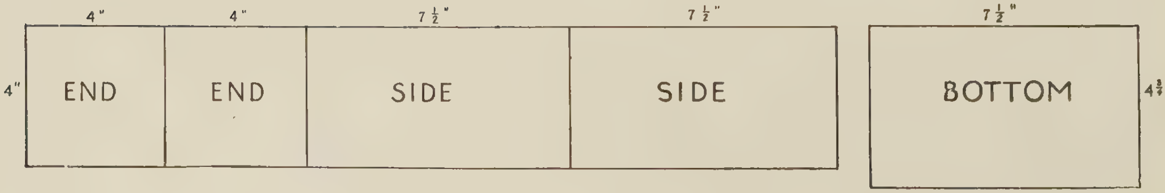




interesting toy than if he is made "thin."

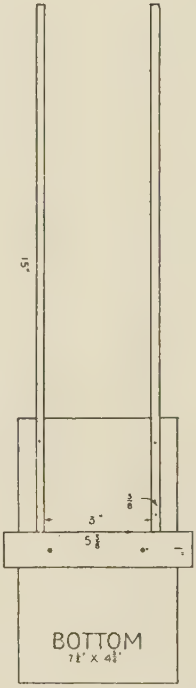
Donald used stove bolts to fasten his horse together. He made the holes for them with his gimlet. The bolts are 3/16-inch thick, and come in different lengths. You will need a longer or shorter one as your horse is thicker or thinner. Use a screwdriver to put them through the small holes made by the gimlet. If the holes are large enough to slip the bolts through without screwing, the horse will not stand firm. The screw nuts on the ends of the bolts are of the kind that people call "wing nuts." They are very easy to screw into place and tighten with your fingers, but you may think the little square nuts that come with the stove bolts are quite easy enough to put on, and of course your horse will look better if you use them. Stove bolts come with round heads and also with flat heads. The round headed kind look neater, Donald thinks. A horse made out of thin wood can be held together by cotter pins. They are cheaper than stove bolts and come in boxes of assorted sizes. The ends can be bent with the pliers to hold the pin in place. Cotter pins are convenient for a good many things. You will see a picture of them on this page.

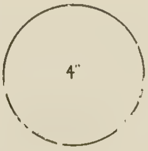
When you have finished your horse you will surely want a cart so that you can "hitch him up." On this page you will see the one Donald made. He laid out the side and end parts on a piece of board before he cut them. He has found that he can save his wood when he does this. His board was 3/8 of an inch thick,



4 inches wide and 1 foot, 11 inches long. But Donald does not write it down that way. He has learned to write down measurements the way a carpenter does, and uses a mark like this ′ for feet, and one like this ″ for inches. He would write down the size of this board, ⅜″ x 4″ x 1′-11″, and speak of it as being "⅜ inches by 4 inches by 1 foot 11 inches." You will find it convenient to write your measurements and speak of them in the same way.

The pieces for the two ends of the cart are cut 4 inches long and, as the board is 4 inches wide, they are each 4″ x 4″. The sides measure 7½ inches long and 4 inches wide so they are 7½″ x 4″. The bottom of the cart is cut from a wider piece of wood and is 4¾″ x 7½″. Don nailed the pieces of his cart together with brads so as not to split the wood. Of course any nail driven too close to the edge of a piece of wood will split it. Donald tries very hard not to do that, but to think each time where he ought to put his nail before he starts driving it in. He made the shafts and the axle from narrow strips of wood nailed to the bottom of the cart. The shafts are ⅜″ thick, 1″ wide, and 15 inches long, so they are ⅜″ x 1″ x 1′-3″. They project about 12″ beyond the body of the cart and are set 3″ apart. At the ends they have been pared with a knife to narrow them a little. The axles are made of a strip of wood 1″ x 1″ x 5⅜″. They project a little beyond each side of the cart. The wheel of a real cart, as you know, is always set out a little from its body.

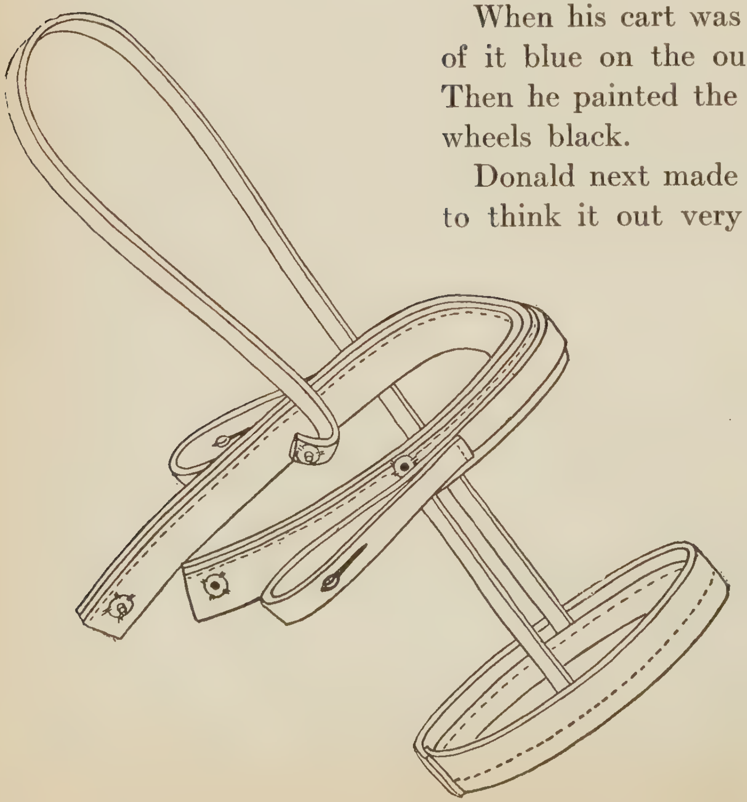




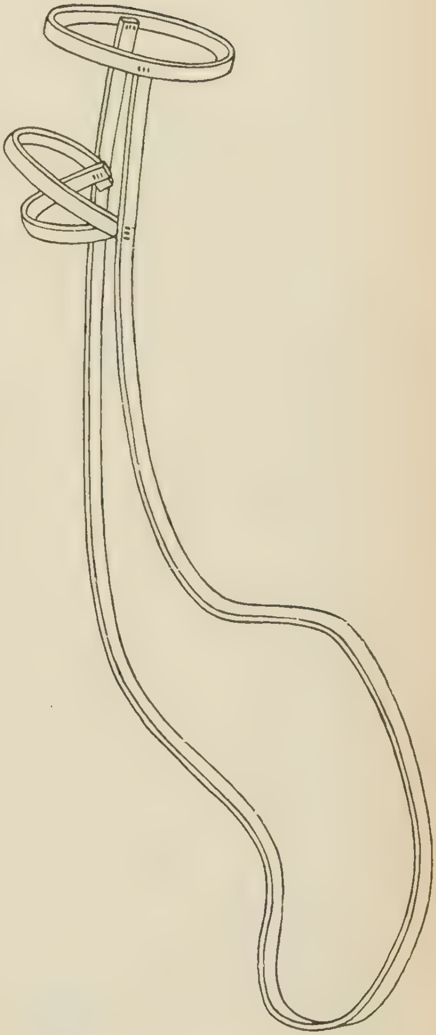
To cut wheels and make them round and even, is not an easy thing to do. But Donald does it very nicely with his coping saw. He puts something round, like a saucer or a butter dish, on his wood and draws around it. Sometimes he makes a sort of compass out of a nail and a piece of string. You probably know how to do that, by tying one end of your string to your pencil and the other to the nail, and hammering the nail a little way into the wood. The string, of course, needs to be half the diameter you wish to make your circle. After a wheel is cut, Don smoothes the edges very carefully with his sandpaper rasp, for, as you know, an uneven rim on a wheel makes lots of trouble. The wheels for this cart are 4″ in diameter. Don drew them around the cover of a coffee can. Then he cut a paper circle just the same size, and folded it in quarters. That gave him a guide by which to find the center of his wheel. The place where the two folds crossed each other, gave him the center of his paper circle, and it was easy to lay it on the wheel and mark the center of that by it. Of course wheels have to be nailed to the axle through their centers.

When his cart was finished, Don painted the body of it blue on the outside and yellow on the inside. Then he painted the shafts and axles yellow and the wheels black.

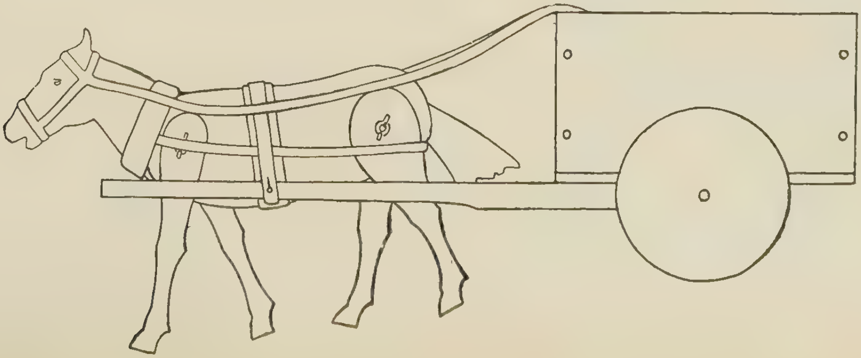
Donald next made a harness for his horse. He had to think it out very carefully, because, like ever so

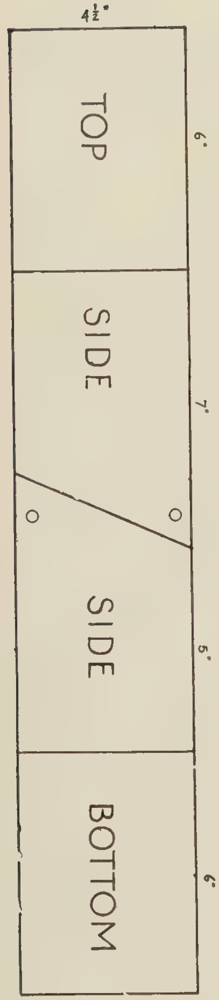


many other boys of today, he knows a great deal more about autos than he does about horses, and how to hitch them to a wagon. He found that he must make a girth to go around the horse's body with loops or "holders" at the sides to hold the shafts of the wagon in place, and that the horse must have a collar attached to the girth so he could pull. Then he must have a bridle on his head and the reins must be attached to that. Here are some pictures of the harness that he made. He cut some of it from the tops of a worn out pair of shoes, and some of it from an old pair of heavy gloves. The reins and some other pieces were made from a pair of new brown shoe laces. He found he could sew the leather just like cloth, with a needle and thread. A tiny round headed tack set in each shaft and slipped through a little slit in each holder, kept the shaft in place when Dobbin was finally hitched up.



Of course Donald has made a bird house. Nearly all children who work with hammer and saw do that sooner or later. He made a wren house and took great pains to get it the right size and put the front doorhole in about the place where Mr. and Mrs. Wren like to have it put. Birds are very particular about the houses they live in, and it is quite necessary to know something about their tastes, before trying to make them a present of this kind. Robins, for example, could never be expected to live in such a house as the one Don made. They

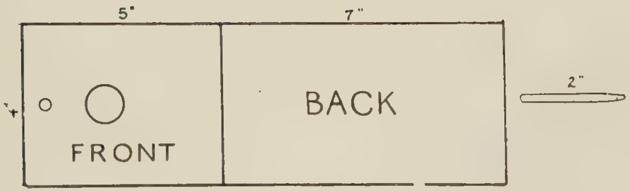


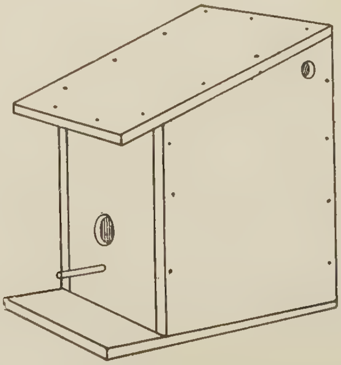


prefer to build their nests in a sheltered place of their own choosing. A wren, on the other hand, will be grateful for almost any kind of a small box-shaped place to live in, if we are careful to make the door-hole small, about ⅞" in diameter, and keep the floor space small, about 4" x 4". The small size of the hole will keep out larger birds that might harm the wren family. Mr. and Mrs. Wren are very particular on that point when they go house-hunting.

Don cut the parts for his wren house from two strips of ⅜" wood, one 4½" x 2' the other 4" x 12". You will see by the drawings on this page how carefully he laid out his pattern. Not a scrap of wood was wasted. The piece used for the front is 4" x 5" and the hole, just about the size of a silver quarter, is set 1¼" from the bottom. Wrens are not particular about having their door-hole set high in the front of their house, but are satisfied with any position from 1" to 6" above the floor. The little perch is made from a short piece of ¼" dowel stick set in a hole made with the gimlet. Donald made the door hole by starting it with the gimlet and then enlarging it with his jack-knife. Sometimes he uses his coping saw for enlarging a hole. The exact measurements for the house are given in the plans on the margin of this page. A bottom piece 6" x 6" makes the house look prettier as you can see by the pictures.

It is an important thing to open a bird house and give it a good house cleaning after its feathered tenants





have finished using it for the season. Another important thing is to put small ventilating holes near the top of the side pieces. These can be cut just as the door-hole is cut.

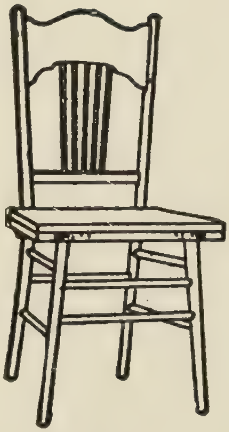


Fig. 7.
A Chair Saw-Bench

As soon as Don has his cross-cut saw, he will need some kind of a saw horse or bench to use with it. A chair makes a splendid saw bench, but unless it is an old one that no one wants for other purposes, it has to be protected in some way. On this page you will see a wooden cover that can be used on top of a chair seat. It is made of two boards, 8 inches wide by 2 feet 4 inches long. They are fastened together by two strips of wood called "battens" that are just the thickness of the seat, and have been shaped on the inside edges to fit its curve or slant. (A, B.) A small piece of wood is screwed to each batten to make a "button." When the cover is used several thicknesses of cloth or newspaper should be put over the chair seat and the buttons turned to hold the cover in place.

But the big thing Don expects to do is to make a work bench like the one he watched Mr. Sands make a few days ago. Indeed he helped Mr. Sands all the time he was working on it. The pictures on pages 280, 281 and 282 will show you how it is put together.

The legs (A, Fig. 1) are cut from 2-by-4 stock, and are 2′-4″ long. The top cross-pieces (B) are of the same material and are 22″ long. The rails below them (C) are made out of ⅞″ boards cut in strips 4″ wide and 22″ long. The front and back rails (D) are 4′ long. The

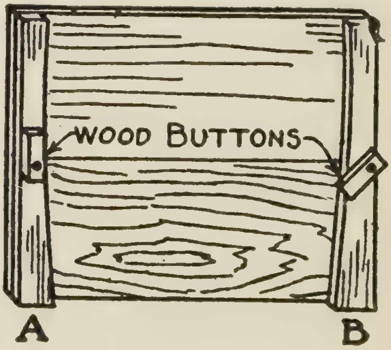
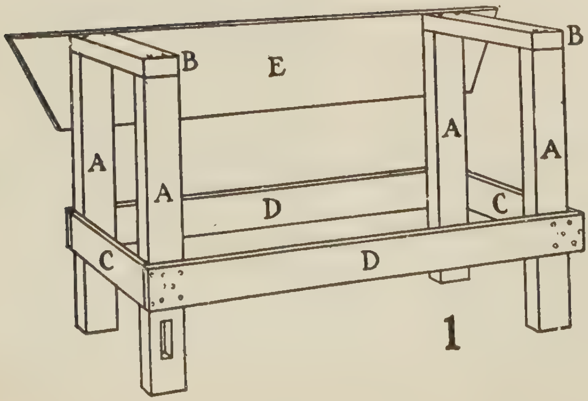


Fig. 8.
Cover to Protect Chair

rails are nailed to the legs 8″ from the bottom. The long pieces (E) that are nailed to the sides below the top, Mr. Sands calls "aprons." They are made of boards 10″ wide and are cut 5′ long. They are nailed to the legs and project the same distance at each end of the bench. The top of the bench is made of three pieces of board 2″x8″x5′, nailed to the cross-pieces (B). Each end is finished by fitting in a piece of 10″ board and nailing it to the legs.

Fig. 2 shows the way to make the vise for holding a piece of wood firm when you are working on it. The big screw is made of iron and can be bought at a hardware store. It is called a bench-screw. The "jaw" (F) is cut from a plank 2″x6″x2′-6″. The sliding strip (G) is of ⅞″ board and is 3″x14″. It has five holes in it that Mr. Sands bored with his brace and bit, and is nailed to the jaw at one end. The other end is slipped through the hole or "mortise" that you see in the right hand front leg (Fig. 1). Mr. Sands cut this mortise with his chisel after he had marked the outline in pencil. It is made just a little larger than the sliding strip so that can be slipped through it easily. The iron bench screw is fitted into a hole cut through the jaw and then through the apron and bench leg. Before he cut this hole with his brace and bit, Mr. Sands nailed the jaw to the apron and leg with a couple of big nails. He drove these only part way in, and left the heads projecting so he could easily grip them with



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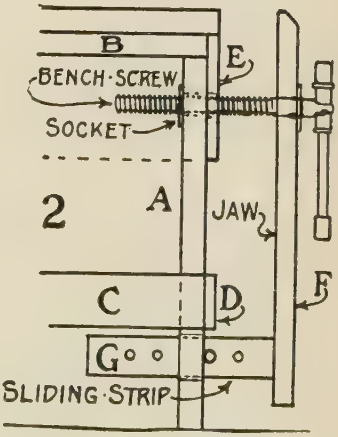
the claw of his hammer and pull them out later. In this way he could be sure of getting the hole in the right place, and fitting the parts of the screw into it properly. The threaded socket that comes with the bench screw was set into the leg and screwed in place. Then the bench screw was slipped through the hole in the jaw and screwed through the socket as far as it would go, and the iron plate at the handle end was screwed to the face of the jaw. Last of all Mr. Sands cut the top edge of the jaw in the shape the picture shows,—"beveled it" as he said. Then he drew out the nails that held the jaw to the table. He cut a peg from a piece of dowel stick, and put it in one of the holes in the sliding strip, to keep the bottom of the jaw directly under the top. This peg has to be changed from one hole to another, he told Don, according to the piece of wood you are holding in the vise. If the bottom is pushed in too far, the jaw will not grip your work squarely.

Fig. 3 shows you the bench when Mr. Sands had finished it. The little block of wood nailed to the top just back of the jaw, is called a "bench stop" and helps to keep your work in place. The different holes that you see cut in the front apron to the right of the jaw, are made to hold pegs that can be used to support the ends of the boards placed in the vise. A small iron vise has been screwed to the right hand end of the bench. This is for holding screws, nails, and other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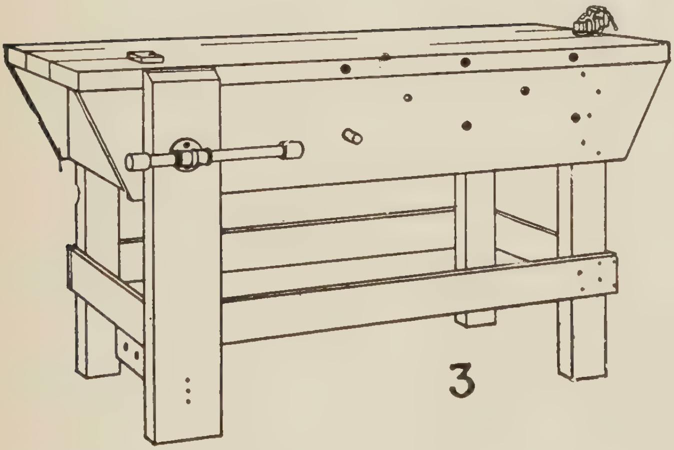
small pieces of metal when you need to file them.

Of course a boy of Donald's age could hardly expect to make a bench like this all by himself. It is a wonderful thing to have a good friend like Mr. Sands to help you and show you how to do things. But many other boys and girls will find their fathers,—yes, and their mothers, too, can help them make one. Then with a few good tools, they can make ever so many other things,—things that are useful, some that are beautiful, and some, perhaps, that are just interesting or amusing.



CHAPTER XX

With Warp and Woof

Of course you remember our old friends, Mary and Billy, who invented the "scrap game" and were so interested in the wool and the silk, the cotton and the linen, that are made into the "Things the children wear." Mary and Billy found out about these materials and where they come from, but the girls and boys who made the looms you see on Source Picture Number 20, did more than that. They learned how cloth is woven, and they did a good deal of weaving themselves. To be sure none of them did any spinning, which is always the first step in the manufacture of the raw material into cloth of any kind. But they all understood before they had gone very far with their weaving, that the fibres from the flax plant and the cotton plant, from the sheep's wool and the silkworm's cocoon, have to be arranged in even strands and then twisted into threads before cloth can be made from them. They understood, too, something about the different ways in which spinning can be done.

In the most ancient times people spun slowly and carefully with their fingers. They carded or combed the wool, and wound it on a distaff, a forked stick which they held under their left arm, while they drew and twisted the fibre into a thread with the thumb and forefinger of the right hand. As fast as the thread was spun they wound it on a stick called a spindle. Later on, spinning-wheels were used. They were invented first in India, and with them the making of thread became an easier and speedier process. On this page you see a picture of a small spinning-wheel. The women who used little wheels like this one, sat down to spin. The wheel was turned by means of a treadle underneath that you worked with your foot. They had big spinning-wheels, too, like the one on page 302 and people stood up as they worked at them.

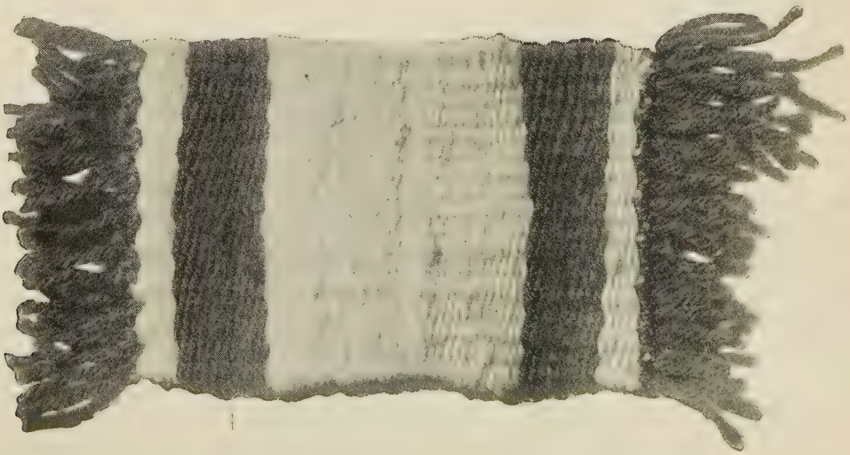
In the old days, all cotton cloth and silk cloth came from the far away eastern countries, and how they were made was kept secret from the rest of the world. But little by little, as years went by, those two important secrets became known, and today silk worms and cotton plants are raised in many parts of the world. Cloth is still woven by hand in many places, but, as you know, most of it is made in factories where machinery run by steam, by water-power or electricity takes the place of the old-fashioned spinning wheel and the hand-loom. The factories are often called "textile mills." The word "textile" is another word for cloth.

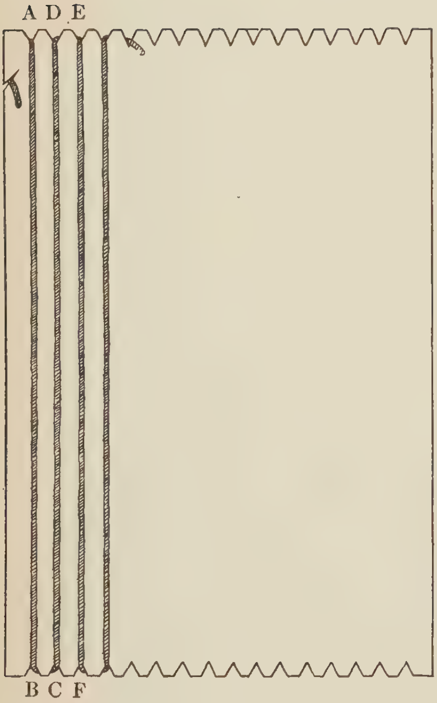
Perhaps you have visited a factory where some kind of textile was being made. If so, you know how elaborate the machinery is, how noisy it is, and how many

wonderful things it does. It seems almost to be alive. It is hard for boys and girls, and for grown people, too, who visit such a mill for the first time, to understand how it does its work. But if you have done some weaving yourself, even on a small loom like some of these in the Source Picture, the work of the mill is very much easier to understand. To weave yourself, makes you appreciate, too, that wonderful inventions had to be made by ever and ever so many people, before it became possible to build up the complicated machinery in the textile mills of today.

If you pick a scrap of cloth to pieces with your fingers, you will find the threads run in two directions, crossing each other first over and then under, just as a stocking is darned. These threads are called the "warp" and the "woof" of the cloth. The "warp" threads are the ones that run the long way. They are the strong threads, just as the fibres that run the long way of wood are the strong ones. The fibres that run the short way are called the "woof" or the "weft", and by some people the "filling."

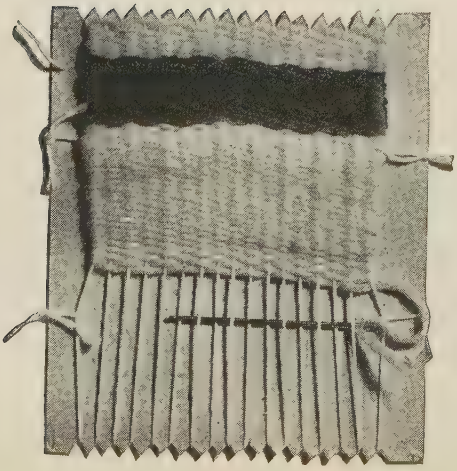
To weave we must have some kind of a frame on which the long, strong threads of the "warp" may be stretched side by side, and held in place, while the shorter threads of the woof are worked or "woven" through them. Such a frame is called a "loom." The very simplest loom that anyone can make is a cardboard loom like the one shown on page 286. In school, chil-





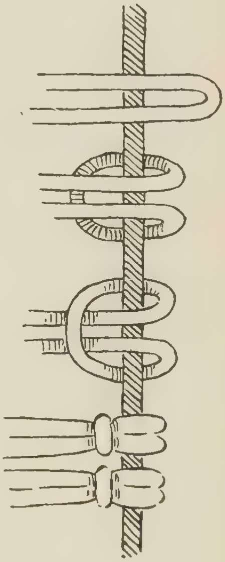
dren often weave doll's rugs on looms of this kind. Cut a cardboard rectangle of the size you want your rug to be, and rule it off with pencil lines running from end to end, as you see in the picture. Put each line ¼ inch apart. It is best to have an *odd* number. Some patterns require an odd number of the warp threads. Notch the ends of your card with your scissors and then start your warp thread at "A." The end can be caught by drawing it through a small cut at the side of the card, or by tying it around the point to the right of A. From A take your thread to B, then back of the point to C and up to D, back of the point from D to E, down to F, and so on across the card. Fasten your end by making another cut or by tying as at the beginning. Use a bodkin for putting in the woof. Leave an end that can be fastened in afterwards, and work the threads over one and under one, back and forth from side to side. This is the "plain weave." It is the oldest of all weaving stitches, and the one used for the greatest number of materials. Before starting to put in the woof, it is a good plan to tie the last warp thread in one or two places on each side of the loom. That will hold it straight and keep you from pulling the woof too tight as you work in it. The second picture shows you where this has been done, by sewing through the card with a big needle and heavy thread, and tying the thread around the side of the loom.

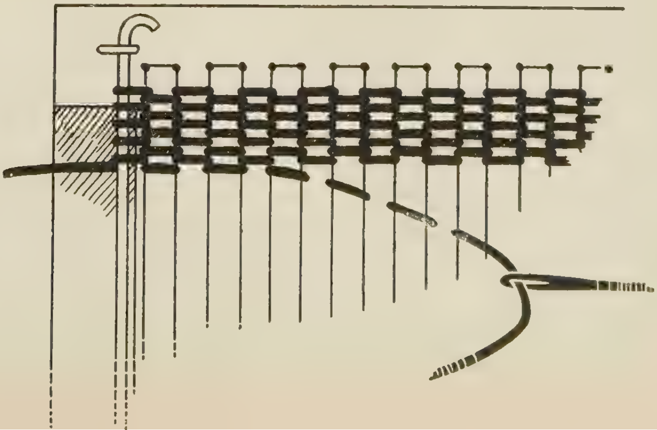
You can make splendid rugs for the "House where

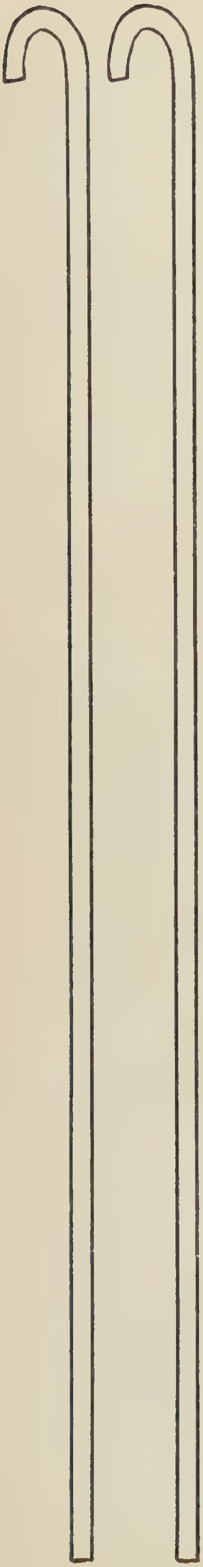


the children live" on looms like this. They can be made of various materials. A good way is to string your loom with warp threads of knitting cotton or soft twine, and then use knitting wool for the woof. Raffia is good material, too, for little rugs of this kind. In schools, children often use the heavy cotton roving that is sold in stores having kindergarten supplies. At home it is easier to get left-over pieces of knitting yarn, and they make as nice a rug as one can have. When you have filled in the whole length of the rug with the weft threads, it is ready to be taken from the loom. To do this, lift off the warp threads from the points in the edge of the cardboard. Your rug is now ready for its fringe, and this can be made from short lengths of the knitting wool or raffia. A crochet hook or your bodkin can be used to pull the fringe through the edges of the rug at each end. The picture shows how it is knotted or "tied." Even it off by trimming the ends with your scissors after the whole row has been tied.

The loose ends of the warp threads should be fastened by working them into the rug after you take it from the loom. Any loose ends of the woof should be treated in the same way. But the ends of the woof threads will not need to be specially fastened if you are careful to weave them in each time as far as they will go. Let the new thread lap over by starting an inch or two back of the place where the

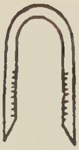






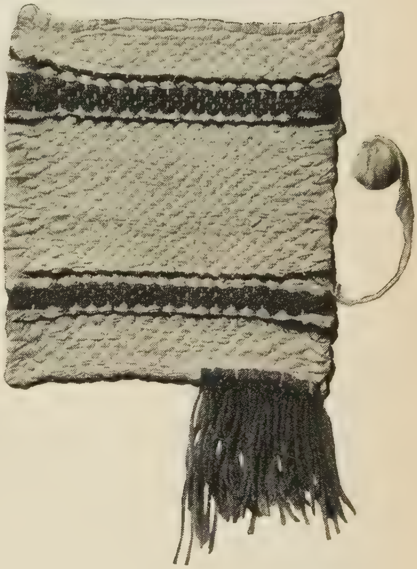
old one ended. This makes the "double weft" that you see in the picture. As the woof is filled in, the rows should be packed closely together, entirely hiding the warp threads. On the cardboard loom, this can be done with your bodkin. On a larger loom use your fingers or a stick called a "batten" such as you will see in Figure K of the Source Picture. A cardboard loom can be easily turned so that all the weaving is done with your right hand, but with a larger loom, like those in figures "E" and "G" of the Source Picture, you should work from the bottom upwards, and learn to weave the woof threads back and forth from side to side with either hand. This is the way a real loom is handled, and it makes it easier to pack the woof threads against each other as you work.

The picture on page 289 shows a home-made loom on which you can weave in this fashion. It is made from four pieces of wood nailed together with a row of small brads set ¼ inch apart at the top and bottom of the frame. Heavy wire pins fastened at the sides of the loom will keep the edges of the web straight as you weave. Get the pieces of wire cut at the hardware store. They should be a little longer than the loom so they can be bent at one end with the pliers into a hook or an eye. They can then be more easily held in place. Small staples should be used to fasten them to the loom. When you use them, weave

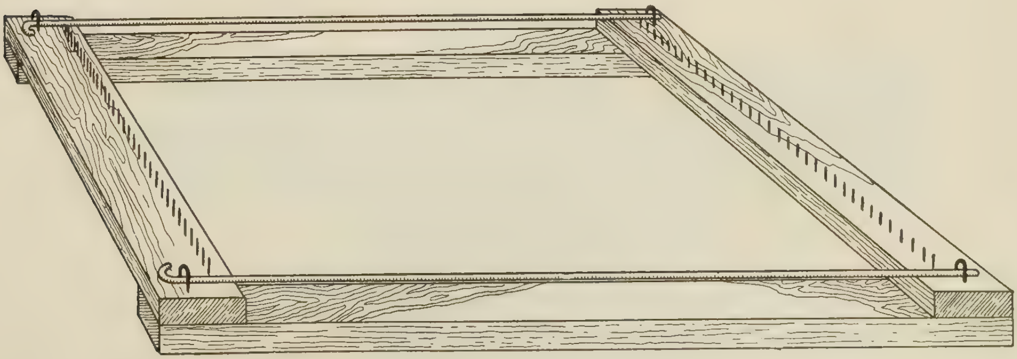


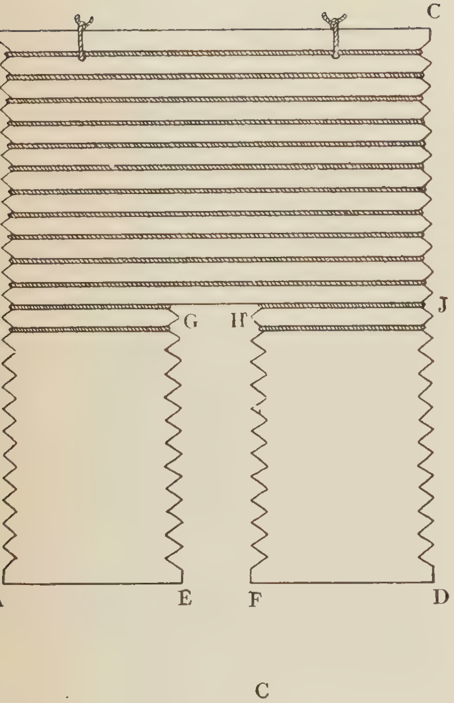
around both the wire and the warp strand each time you reach the edge. When the weaving is finished, unfasten the wire pins and draw them out before beginning to take the web from the loom. Double warp strands at each side help to strengthen the edge of the web and should be used whether wire pins are used or not.

On a loom like this, you can use rags for filling, and make a rag rug large enough for a big doll to use, or a mat that can be used on a table. Of course, raffia, yarn or roving will make good filling too. If you use rags, tear them into strips ½ inch wide. If the strips are short ones, sew the ends together. Get the rags all ready before you begin to weave them, and roll them up into a ball. This keeps them flat and prevents their getting tangled. The picture on this page shows you a rag rug of this kind. The fringe is made of woolen yarn.



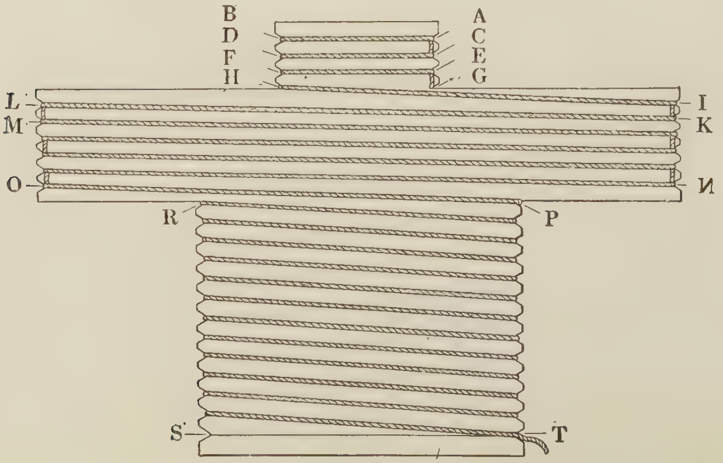
The Teddy Bear sweater and knickers that you see at the left hand side of the Source Picture are hard to make, but very interesting. The card board loom for each one must be planned according to the size of the doll or the bear who is to wear them. Make the loom for the knickers the same length as the doll, measured from the waist to just below the knee. Its width should be 1¾ times that of the doll. Put the notches ¼ inch apart on the sides A, B, and C, D,—also on G, E, and H, F. Tie the warp at D



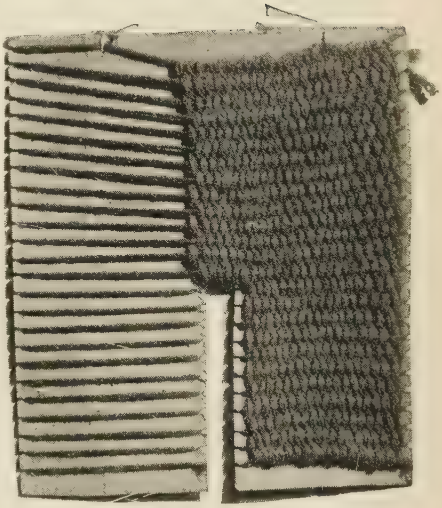


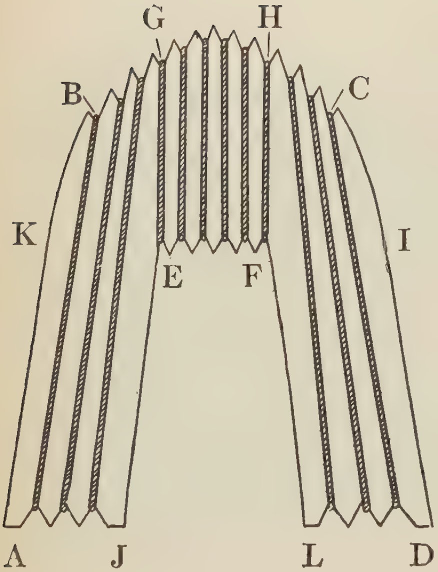
and wind around the leg to J, then to I, and down the other leg. From A, bring the warp back to I and continue winding to the top of the loom B, C. Fasten your thread by tying or by a cut in the side of the loom. Hold the last warp threads at the top B, C by sewing and tying them in two places through the edge of the loom. Then weave the woof threads up and down the leg, beginning at I, G, and weaving to A, E. Turn the loom over and weave on the other side to a point opposite I, G. Then weave both sides of the strip I, G, H, J, turning the loom and weaving over the edge each time at G, H to make the seat of the knickers. At J, H begin again to weave the upper side of the leg back and forth from J, H to F, D. Then turn the loom over and weave the other side, finishing at the line opposite J, H on the under side. To take off the knickers, bend the loom or break it in pieces. Run a drawing string through the top of the knickers and this will serve to tie them securely on the doll.

The loom for the sweater should be as long as you wish to make it, and 1¾ times as wide as the doll's body. The sleeves, too, should be 1¾ times the measurements of the doll. Make the cardboard loom as the picture shows, with notches ¼ inch apart. The collar may be made to stand up, or made longer to roll over. Start the warp at A. Take it to B, and around on the under side of the loom to A again. Then,



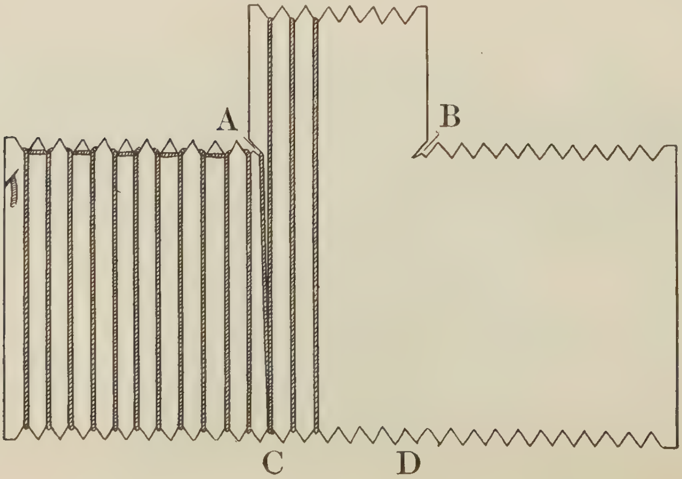
as the neck must be left open at one side, loop the thread over the point A, C, and carry it back on the under side to D. Then carry it from D to C on the upper side, under the point C, E, back on the right side to F, across on the under side to E, over the point E, G, back on the under side to H, and across on the upper side to the bottom of the sleeve at I. In the strip L, I, N, O, both sides of the loom must be threaded separately, as the bottoms of the sleeves have to be left open. So carry the thread from I under the point I, K, and back on the upper side to L, under the point L, M, and back to the bottom of the other sleeve again, to the notch just under K. Continue in this way until the strip L, I, N, O, is threaded on the upper side. At P begin winding around the loom, carrying the thread on the under side to R and continuing to wind to the bottom, S, T. Fasten at T. Turn the loom on the under side and start a new thread at I, tying it around the point I, K. Take it to L, over the point L, M, and back to K. Continue until the under side of the strip L, I, N, O, is threaded, and fasten your thread by tying it around the last point. The loom should have an even number of notches at the bottom of each sleeve, six, eight, ten, depending on the size of the sweater. Weave the woof threads around the sleeve, starting at L. When N is reached, weave over the shoulder to the bottom. Then turn the loom and weave up and over again.





Continue in this way, weaving over the shoulder, and leaving the bottom open until H is reached. The neck as well as the bottom must be left open, so weave up and down, on the upper side of the loom, all the way over to the other sleeve at G. This will leave an opening on the shoulder from G to I. Weave around the sleeve, turn the loom over and fill in the space remaining on the other side. The opening at the neck and on the shoulder should be closed with tiny buttons and loops. If you like you can weave the sweater without the collar, and weave collar, cuffs, belt and pocket separately. They could be made of a contrasting color, and sewed on after the rest is finished.

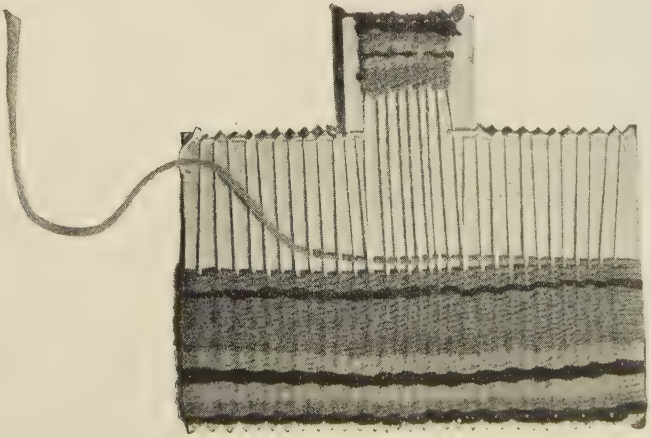
The loom for the doll slippers must be made according to the measurements of the doll's foot. First make the cardboard shape, A, B, C, D. Cut the notches as the picture shows, taking care that there shall be an uneven number of warp strands in each side of the slipper, and an even number in the strip at the toe, E, F, G, H. String the loom on one side only, beginning at A. Start the woof at A, and weave the strip A, J, E, K. Break off your thread and begin again at D. Weave D, L, F, I, then across from I to K, and continue on, filling in the toe. Take the slipper from the loom. Sew the back edges C, H and G, B together and overhand the slipper to the sole you intend using. Soles can be cut from



a piece of chamois skin or an old glove and shaped by the doll's foot.

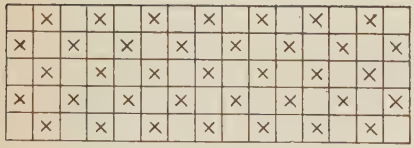
A bag can be woven on a cardboard loom by winding the warp threads around the edge at the bottom, over each point in the top edge, and back again around the bottom edge. In that way the top will open when you take it from the loom. The warp for the handle of the bag should be wound over and over, closing the handle at the top as the bag is closed at the bottom. The pictures on page 292 show the loom strung for such a bag or pocket, and the bag partly woven. A small cut in the edge of the loom (A, B) where the handle starts, makes it possible to change from the open-top-closed-bottom method of stringing the bag, to the closed-top-closed-bottom method of stringing the handle. Treat the warp strands that run from A to C and from B to D as if they were a single strand when putting in the woof.

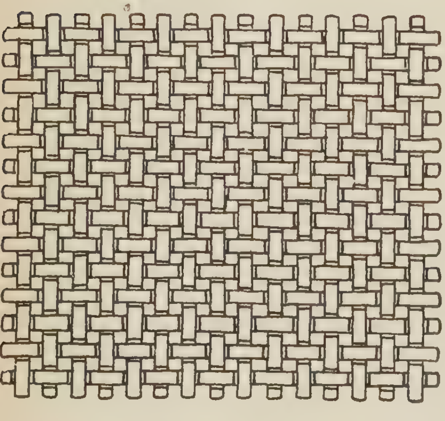
The three little looms that you see on the right-hand side of the Source Picture are made from empty boxes of the kind used for letter paper. The warp strands are strung from cuts ¼ inch apart made with scissors in the opposite sides of the box. A knitting needle is run through at each side, to keep the edges from drawing together as you put in the filling. As you will see, a loom of this kind is easily made. It is very practical too. The weaving is done with a bodkin. In the pictures shown, both warp and woof



are of woolen yarn. Box looms like these are convenient to use when you are learning the "twill" or the "satin" stitch.

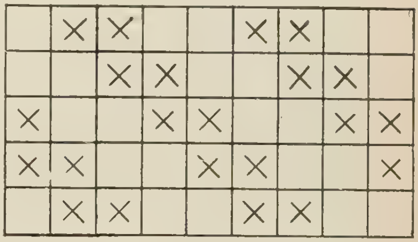
There are three different weaves or stitches that can be used for cloth,—the "plain weave," the "twill," and the "satin stitch." Cloth of every kind is woven by means of one of them. The most elaborate weaves are only combinations or variations of them. The plain weave has already been described as the "in and out" stitch in which the filling goes over a single warp strand, and under the next one, "one up and one down," as weavers say. It is like a darning stitch, which is of course an imitation of weaving.

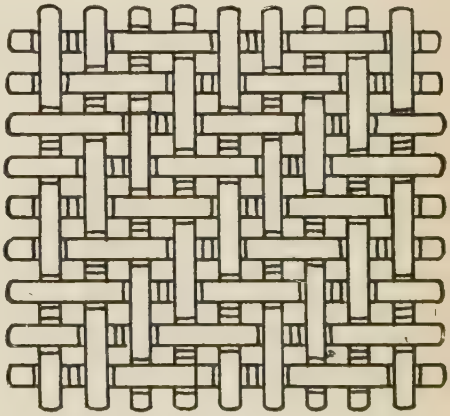




The twill weave is the one used in Figures L and O of the Source Picture. The woof passes over two and under two of the warp threads each time. This is called a 2/2 (two, two) twill. In the little square at the margin of page 295 you can see how it is done. Begin at the lower left hand corner and follow the woof thread over two, under two, across to the edge. As it returns from right to left in the second row, you will notice it passes over one warp thread only at the edge, then back again under two, over two, across to the right hand edge, and finally over the single warp thread that is left at that side. The important thing to remember about the twill weave is this,—as it crosses the web each time, the woof thread passes over and under different pairs of the warp threads, and the pairs are never alike in any two rows that lie next to each other. As it returns each time, the woof goes over one thread that it passed over and one thread that it passed under, in the row before. This shifting makes a stripe in the weave that runs diagonally across the cloth, and for this reason cloth woven with the twill stitch is often called "diagonal." There are a great many different kinds of twill stitch, some of them very complicated, but the principle is the same in all of them—always to divide the warp threads into pairs, but not into the same pairs that were used in the last row. By passing the woof threads over one and under two of the warp threads, that is "one up and two down," you make a 1/2 (one, two) twill. You can also weave two up and one down and get still a different effect. A "right twill" is one in which the diagonal stripe runs to the right side of the cloth. A "left twill" has the stripe running to the left side. The "herring bone weave" is a twill in which the stripe runs first to right and then to left. It is one of the most elaborate weaving stitches.

To weave one of these squares in twill stitch is much more difficult than if we use a plain weave. But the satin stitch is still more difficult and confusing. It is a stitch that was invented, as its name shows, especially for the weaving of silk threads. Threads long enough and strong enough for the

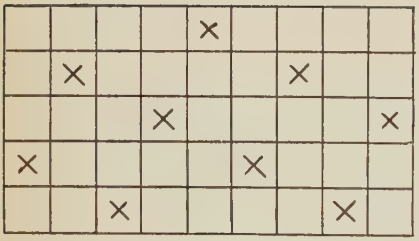


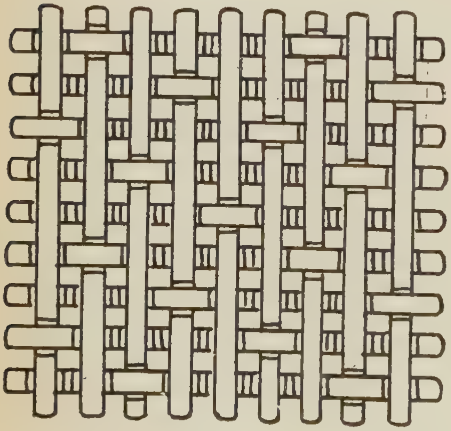


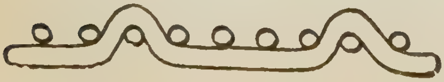
warp are more difficult to secure in silk than in the other textile materials, and it is an advantage to be able to use a great many short, fine threads for the woof. The satin stitch has been planned to do just that thing.

On the margin of the page you see a diagram showing the principle of the satin weave, and the square in Fig. M on the Source Picture is woven in that way. Beginning at the lower right hand side of the diagram "F," you will see the filling thread passes under four threads of the warp and over one, under four and over one. On returning it does the same, except that the warp threads are shifted each time. That makes the single thread passed over in each row, lie always two threads to the right of the one passed over in the row below.

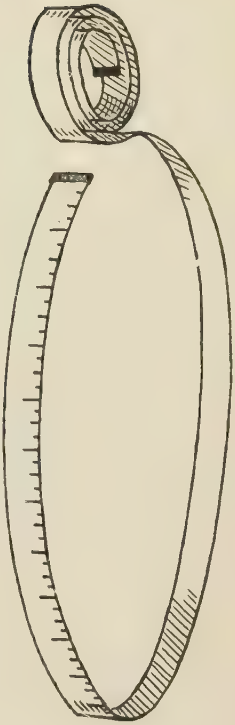
Little squares of the kind that you can weave on these box looms, can be made in plain weave with contrasting colors, or with different stitches, and put together afterwards to make a larger mat or cover of some kind. A cover for a pillow, for example, could be made from several of them. An afghan for a doll's bed, or for a baby to use in his crib or his carriage, can be made very nicely in this way. Weave a few such squares of woolen yarn, and sew them together afterwards by overhanding the sides with big stitches. If you do anything of this sort, plan a design for it first. Alternate your squares on the principle of an





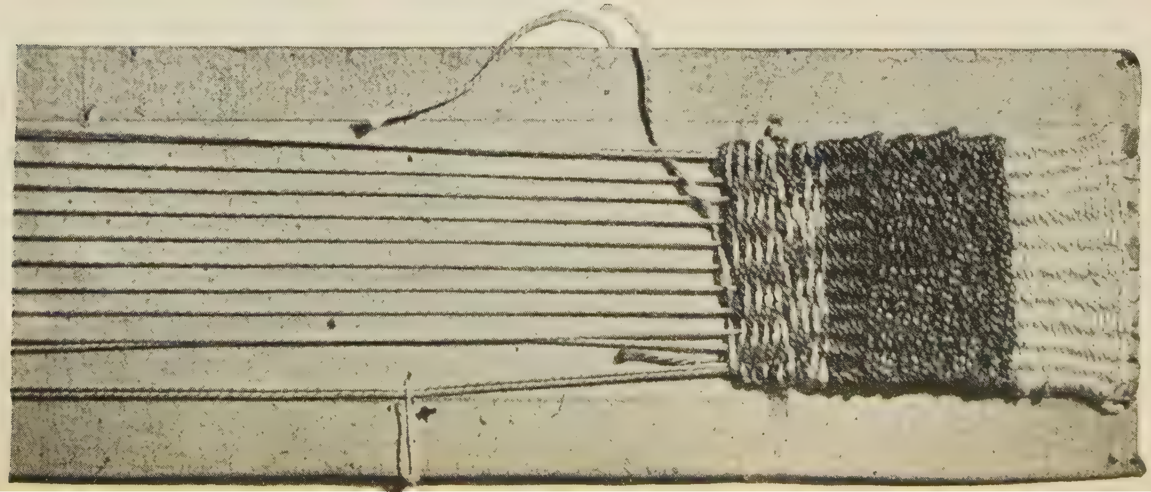


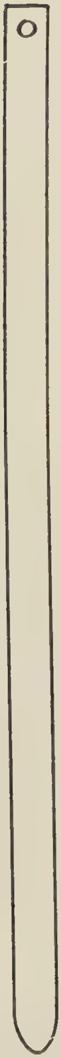
all-over pattern and choose colors that will be pretty together.

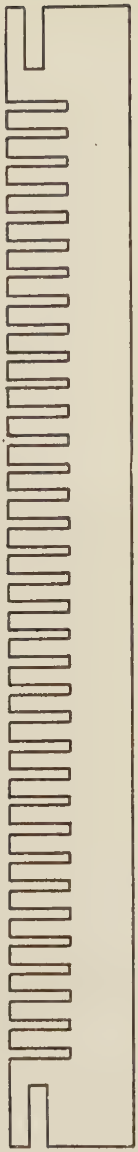


A hat band is interesting to weave, especially if you like to experiment with fancy stitches. It can be woven on a card loom. The one in the picture on this page is strung with 11 warp threads. The last thread on each side is double and has been tied in several places to the card to keep the edge straight. Knitting silk or mercerized cotton can be used to make a band of this kind. Measure the distance around the crown of the hat and make the loom just ½ as long. Cut notches in each end and string the warp threads round and round until you have the width you wish your band. The number of strands should be uneven as 7, 9 or 11. Use a bodkin for weaving. Woof threads of different colors can be worked in to stripe the band, and the different stripes can be made more interesting by working some in twill stitch. Both 1/2 and 2/2 twill can be used as well as the plain weave. It is a good idea to design your band carefully, planning the color and width of the different stripes and the stitches used for each. Then you will have no trouble repeating the pattern as you go on around the band.

The loom shown in figures E and F of the Source Picture is one of the kind that is sold by stores for children to use. Grooves cut in the edge at the top and bottom hold the warp threads. The long flat

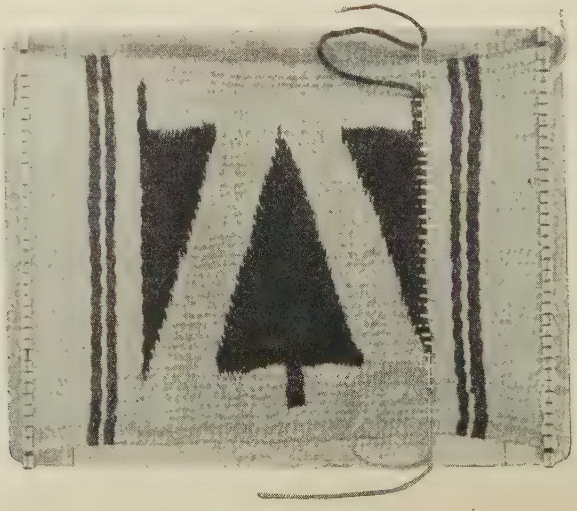




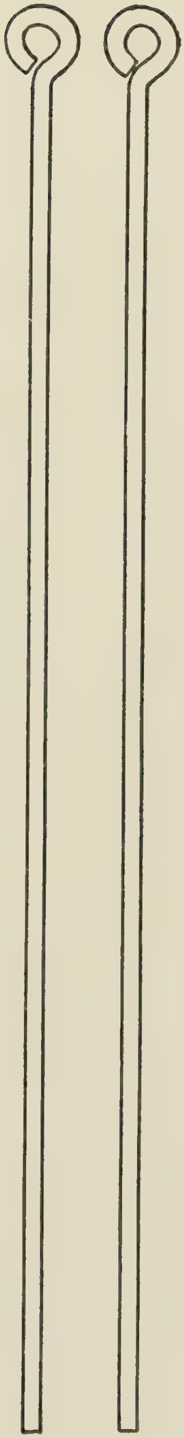


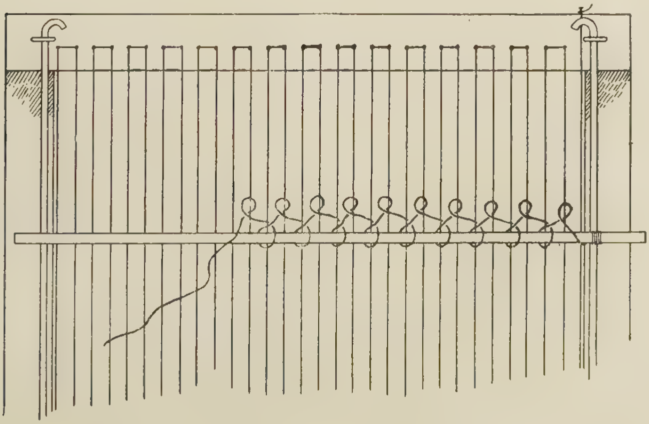
weaving stick, through the end of which the woof has been threaded, helps one to weave quickly when passing back and forth from side to side of the loom. For putting in a pattern, however, one's own fingers or a bodkin are more convenient. Just next the weaving stick you will see a "batten" like the one in the picture on the margin of this page. It is made of wood and has been cut to slip over each one of the warp threads, and keep them straight. At the same time it fits over the wire pins at the side of the loom and is held in place by them. The green mat on this loom had its ends woven first with the weaving stick. Then the middle part with the pine tree pattern was woven in, as you see, partly with the weaving stick and partly with the bodkin. The easiest method to start a new woof thread as we have said before, is to run it in close to the old one, making a double weft as in the picture on page 287. This must be remembered in putting in a pattern. Figure F shows the green rug ready to be taken from the loom. The wire pins have been taken out from the sides, the batten taken off, and the last rows of the woof run in with the bodkin as the picture shows.

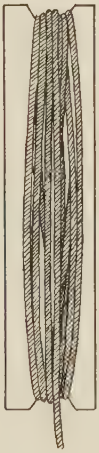
The loom with the brown rug shown in Figures G, H and K was made by our friend Donald, about whom you read in Chapter XIX. As you see, he nailed four pieces of wood together and put a row

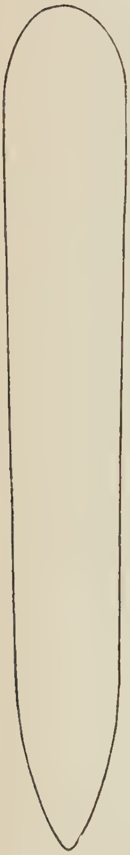


of brads ¼ inch apart in the cross-pieces at each end. The exact dimensions of his loom are not important. If you make one, you may prefer to make yours of a different size. You may also prefer cross-pieces of narrower material, that do not raise the web so high above the bottom of the frame. Donald made his cross-pieces of ⅝ inch material. He cut them 2¾ inches wide and 10 inches long. The bottom strips are also of ⅝ inch material. They are cut 1¼ inches wide and 12 inches long. Wire pins are fastened at each side with small staples. Heddles are used with this loom, also a shuttle and a batten. For this reason it is the most interesting and business-like one of all the looms described in this chapter, and the one most like a real loom. The heddles are made from two pieces of ¼ inch dowel stick about 14 inches long. They are strung to the warp threads with a piece of string, threaded as you see in the picture on this page. Every other warp thread is attached to the heddle in the manner shown, and as you raise the heddle stick, all the warp threads attached to it are lifted up above the others just a little way. The second heddle stick is strung like the first one but is attached to the alternate warp threads, so that every thread in the warp can be raised by one or the other heddle. The space between the raised threads of the warp and the alternate threads, left in their place when one of the heddle



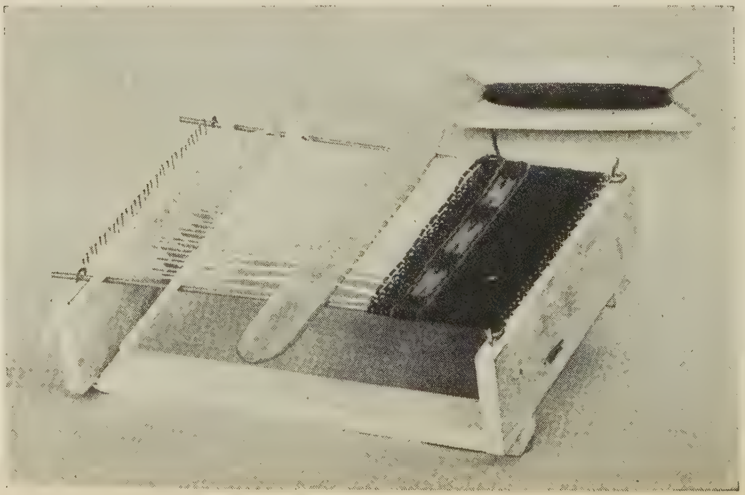






sticks is lifted, is known as the "shed." Figure G shows the way in which the batten is put through the shed, and Figure H shows how it is turned after putting it through. This enlarges the shed and makes it possible to "throw" the shuttle from one side of the loom to the other. In this way the woof thread can be passed very quickly through the loom, without stopping to thread it over and under the warp strands as in all the other looms we have described. The shuttle shown in the picture, has been cut from a piece of cardboard. It is 6 inches long and 2 inches wide. The batten was shaped with a knife from a thin piece of wood and sandpapered until very smooth. The sharpened point has been made quite thin. It is about 12 inches long, 1½ inches wide, and ⅛ inch through its thickest part. In Figure K you see the third operation, the batten "beating" the thread against the web to pack it and make it even.

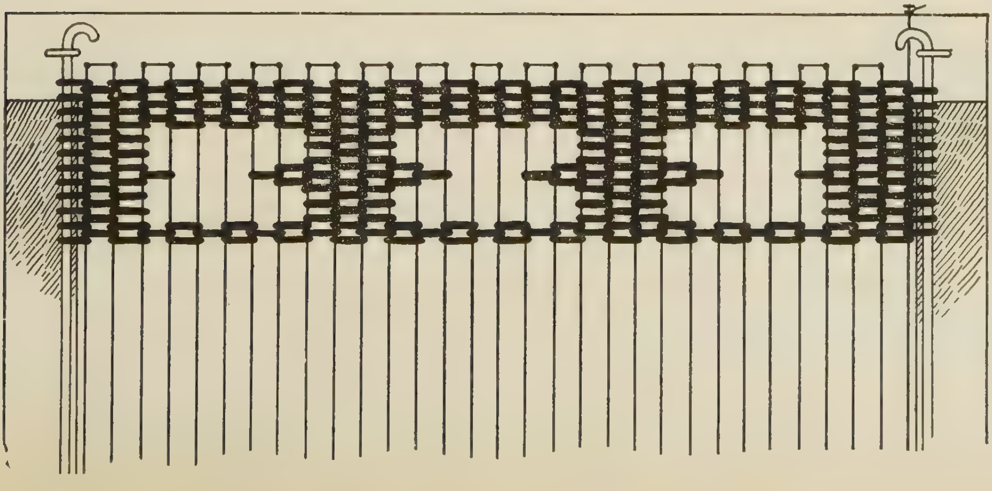
The next step of course, would be to draw out the batten and lift the second heddle, raising the other set of warp threads. The batten would then be slipped through the new shed, and the shuttle thrown from the left to the right hand side of the loom. These three operations,—making the shed, throwing the shuttle and "beating," or packing the thread, are very important in real weaving. The complicated machinery of the textile mills has been designed to

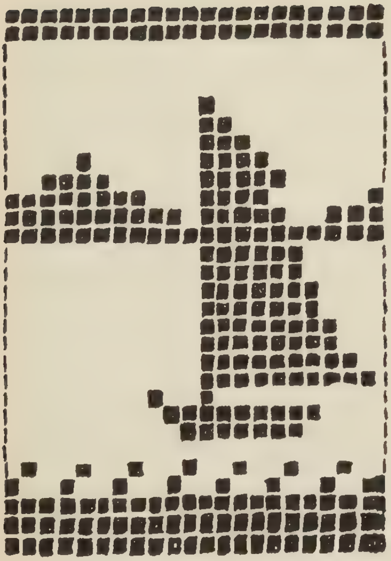


do all of them with the greatest possible speed. Yards and yards of cloth can be woven in a day. A great number of different patterns, too, can be made by adjusting the same machinery in various ways. Sometimes a great many heddles have to be used. As many as thirty are needed to make some patterns. The simplest twill stitch,—one up and two down—calls for three heddles. The 2/2 twill needs four, and the simplest satin weave takes five heddles. The weaving of brocaded goods is an even more elaborate process. It is done on a special machine which raises each warp thread separately, and combines them in different sets as the pattern demands, very much as chords are played on a piano.

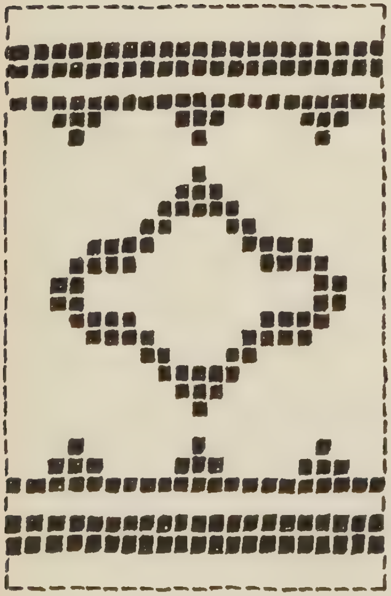
But however complicated the stitch, the weaving of it goes forward like a clock. Every shift of the heddles, every change in the shed, has been carefully planned beforehand by men who are expert in such matters. When the big machines have once been adjusted for the weaving of a special pattern, they do their work with wonderful speed and with surprisingly little help from human hands.

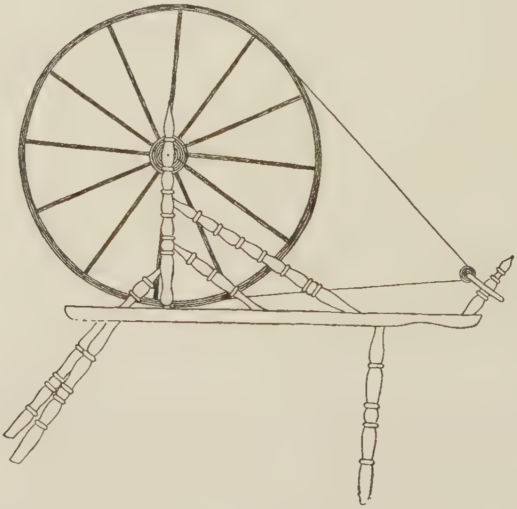
Patterns of the kind shown on the mats in Figs. F and G in the Source Picture can be worked in with the bodkin or with one's fingers. The pine tree pattern in Fig. F was worked in first, and the green ground filled in around it from time to time as the weaving progressed. In Fig. G, the brown





ground was woven first, as the picture on page 301 shows, and the red pattern filled in afterwards. Both patterns were carefully planned beforehand. The best way to do that is to "square" a piece of paper and work out your design in the squares. Make the squares small. Each vertical row will represent a warp thread and each horizontal row, a thread of the woof. With a little practice you can work out very interesting designs on squares in this way. They will be much conventionalized of course, but can be easily copied on a loom.



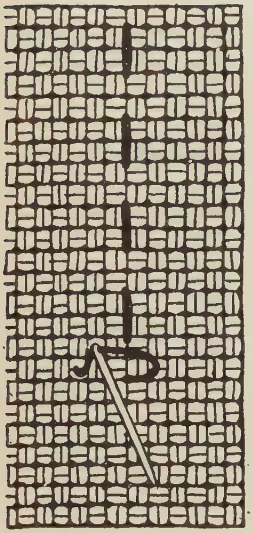


CHAPTER XXI

With Needle and Thread

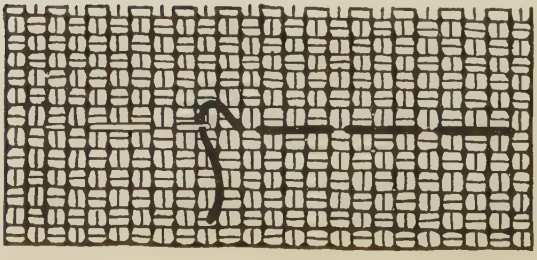
After the warp and the woof threads have been spun and woven into cloth, the wool and the linen, the silk and the cotton, are ready for another chapter in their history. For now they must be made into special things. The "Things the children wear" and ever so many others that they use. It is safe to say that in one way or another a needle and thread will be needed in this last stage of their preparation. Perhaps the sewing will be done by hand in our own homes. Perhaps in factories, by machines as complicated and wonderful as those of the textile mills. But in the end, it is the cutting out and sewing of these materials that makes them ready for our use.

A great deal of sewing is still done at home, and a certain amount, it would seem, must always be done there. For this reason every girl, and every boy as well, should know something about using a needle and thread. Boys pretty generally have the idea that it is unmanly of them to be interested in sewing. Yet if we think over the different people who earn their living by doing sewing of some kind, or who depend on sewing in one way or another in their business, I think we will find that a great many of them are men, and strong, energetic men at that. It is not only the tailors,



the dressmakers, the milliners, who make sewing their trade. Workers in leather, like the shoemaker and the harness maker, use needle and thread. On board the sailing ships there must be always at least one sail maker,—a man who knows just how to make new sails and how to mend the old ones. The men who make tents and awnings, too, do sewing of very much the same kind as the sail maker. The upholsterer and interior decorator depend on sewing as an important part of the work they have to do. Big stores and little ones everywhere depend on the sale of clothing and of other things made with needle and thread, for a large part of their trade. They depend, also, on the sale of materials and supplies to be used for sewing. In theatres and other places of amusement, the beautiful costumes and hangings demand the use of needle and thread, and knowledge of what can be done with them. Then, too, all over the world we find people who sell beautiful embroidery, a form of art very much like the painting of pictures and the drawing of designs.

Sooner or later we all find it important, or at any rate convenient, to be able to sew. People who can sew well and who love to do it have a certain advantage over others. It is not entirely a matter of being able to do something that is useful and necessary. There is another side to it. Sewing is an art, one of those arts that are known as "crafts" because they are so important to the work of the world. Like all other arts and crafts, it gives the person who is skilled at it the



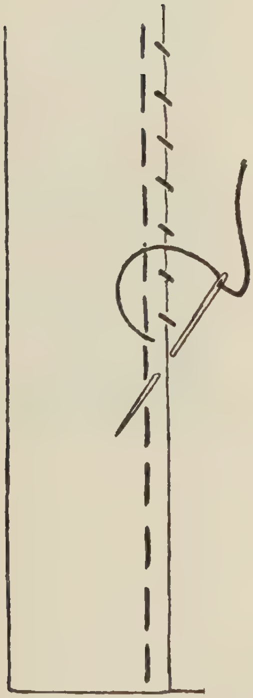
satisfaction of creating and inventing an endless number of interesting or beautiful things. From the oldest days of history wonderful things have been made with needle and thread, and countless people have enjoyed the satisfaction of making them, as well as the satisfaction of having them and using them afterwards.

Of all the tools used for the work of the grown-up world none have been more cleverly devised than the simple ones we need for sewing by hand. They can be used in a great variety of ways and cost very little to buy. Compare the woodworking outfit that Donald needs, with the sewing outfit that you see around the border of Source Picture Number 21. You will quickly realize that any girl who wants a work-basket of her own can buy every one of the things she needs by earning and saving money for it. She can do so far more easily than Donald can supply himself with his tools. Except for the scissors and perhaps the basket, nothing needs to cost more than a very few cents.

Can you name all the articles on the border of the Source Picture, beginning with the work-basket itself, down in the lower left-hand corner, and ending with the big spool of basting cotton in the lower right-hand corner?

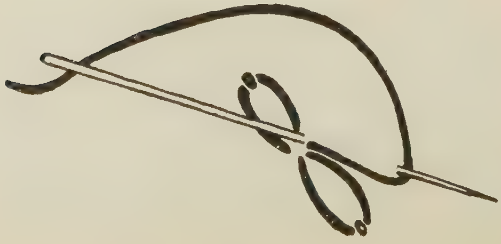
Perhaps you will wonder about the little cushion shaped like a strawberry that you see in the upper right hand corner. That is an emery bag. It is full of fine sand and polishes your needles when you run

them through it. It is never necessary to struggle with a sticky needle or a rusty needle if you have an emery bag in your outfit. Just above the work-basket on the left hand side there is another little berry, with a cord and tassel tied to it. That is a piece of beeswax. It is used to wax the strong threads we use for sewing buttons on our shoes. It makes them even stronger and able to slip more easily through the tough shoe leather.



The thimble, as you see, is given a very important place in spite of the fact that children, when they first begin to sew, are very apt to find it in their way, and to think they can do better without one. When you have once learned to use a thimble you can always sew more quickly and easily with it than without it. So make up your mind to get the thimble habit. Learn how to use one as it is intended to be used, for pushing your needle through the cloth.

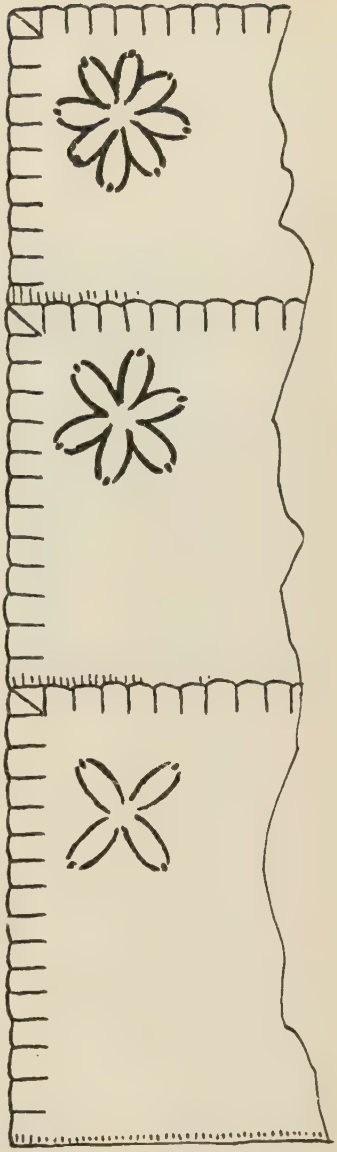
Just above the work-basket you will see a picture of a needle with a thread knotted at the end, all ready for business. Can you thread a needle for yourself? It is a matter of practice more than anything else. In the beginning use a needle with a large eye, a No. 2 Crewel needle is a very good kind to start with. In breaking off a length of thread, it is better to take a fairly short one at first. People who know how to sew generally measure their arm's length for a needleful of thread. You have probably seen them do it. They break the thread from the spool by winding it around the first finger of their right hand. This is better than

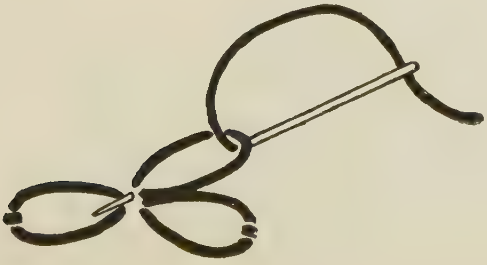


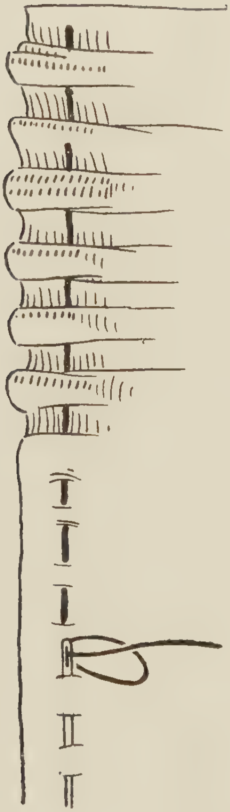
cutting it, for scissors make the end blunt. A needle with a small eye cannot be threaded with a blunt thread. So break your thread and roll it to a point between your finger and thumb before you try to pass it through the eye of your needle.

To make a knot is the next important thing one needs to learn, and that, too, takes a great deal of practice. Directions in a book help very little when it comes to learning things of this kind. The best way is to get some grown-up person to show you just how it is done—by winding the thread around the tip of the first finger on your left hand, pressing it with your thumb, rolling it and drawing the thread tight with the right hand.

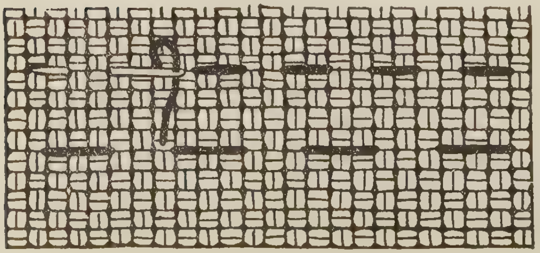
But now suppose your No. 2 Crewel needle is nicely threaded with a piece of heavy embroidery cotton or bright colored knitting wool, and that you have a piece of Java canvas all ready for practicing your first stitches. Java canvas is the material that was used for making the big sampler in the middle of the Source Picture. As you can see, it is full of little holes that show you just where to put the needle through when you are learning a stitch. All around the outside border of the sampler in the Source Picture are stitches of different kinds that people use for finishing the edges of things they are making. The very easiest are the big over and over stitches at the lower right hand edge. They are called *overcasting* stitches and the smaller ones above them are *overhanding* stitches. Over casting is used to finish edges and keep them from raveling.







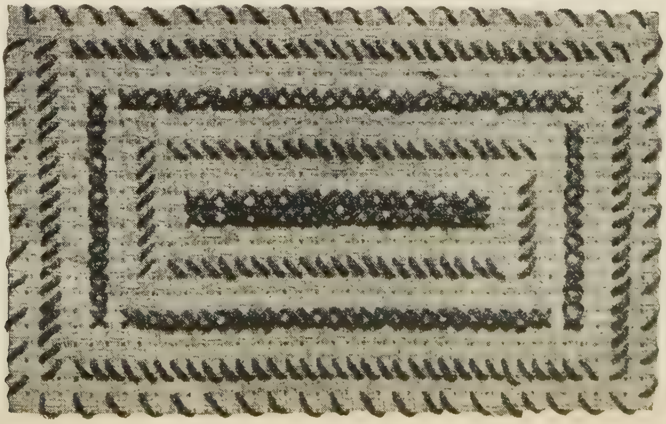
Overhanding is used for making seams of a certain kind. All along the top the sampler is folded over into what is called a "hem". In the center of the hem and a little to the left a needle with a red thread is taking a *hemming stitch*. Just below it you will see the hemming stitch worked flat on the canvas in a green thread. The red stitch at the left hand edge of the sampler is known as the *blanket stitch* and is sometimes called *loop stitch*. The criss-cross stitches that hold the fold on the lower edge in place are *catch stitches*. Some children call them "cat stitch." Did you ever wonder why pussy should have a sewing stitch named for her? I often did when I first began to sew. Just above the catch stitching a needle with a green thread is doing *cross stitch*, one of the first embroidery stitches that people learn. Above the cross stitching, a needle with a yellow thread is putting in a *running stitch*, a very useful stitch for making seams and for gathering. Above the running stitch there is a needle with a red thread, and above that a needle with a blue one. They are taking the long stitches used for basting. The one with the blue thread is making *even basting* stitches. The one with the red thread is making the *uneven basting* stitch. Can you see how they differ and why they have these names? To the left of the basting stitches a needle with a blue thread is making the embroidery stitch called *outline stitch*, or sometimes, "*Kensington stitch*." The yellow thread to the left of that is working the *canvas stitch* also used for embroidery. The pretty branching stitch

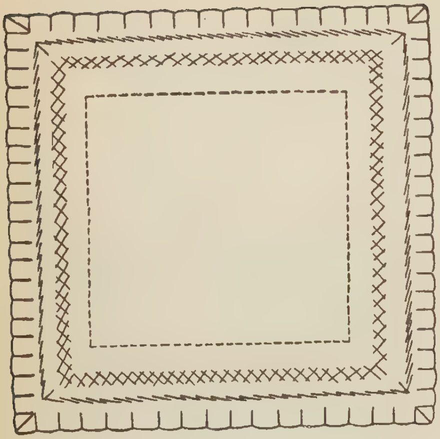


worked in green at the other end of the sampler is also an embroidery stitch. It is known as *feather stitch.* To the left of the feather stitch at the top, the needle with the yellow thread is making a *buttonhole stitch.* Below it are four important stitches used for making seams. The first, in red, is known as *back stitch* and is often spoken of just as "stitching." It is the strongest of all the sewing stitches used for seams, and is the one imitated by most of our sewing machines. The needle with the blue thread just below it is putting in a *half-back stitch,* and the last two needles, one with a red and one with a yellow thread, are taking *combination stitches*—combinations of the half-back and the running stitch.

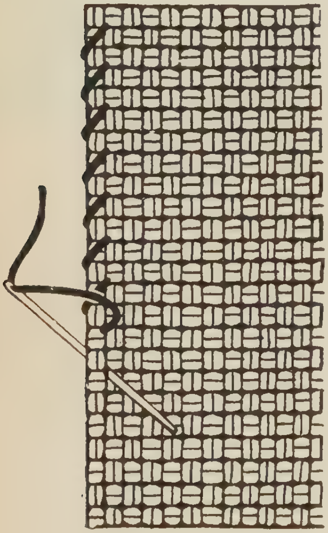
On your piece of Java canvas try copying the different stitches on the sampler. This will not be hard to do if you count the holes each time, and put your needle through in the way the picture shows. Be sure to learn the name of each stitch, too, as you make it. Then after practicing it on the canvas, try it afterwards on a piece of cloth without holes to guide you. Unbleached muslin is a kind of cloth that is good to use when you are just learning to sew. It is soft and coarse and costs very little.

You can make things out of the Java canvas and get practice in the different stitches at the same time. The needle book that you see on this page, for instance, has been made from a strip of canvas 24 holes wide and 40 holes long. It is about 6 inches by 3¾ inches in size. The edge has been overcast all around and the



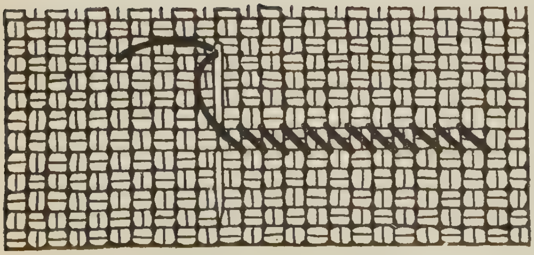


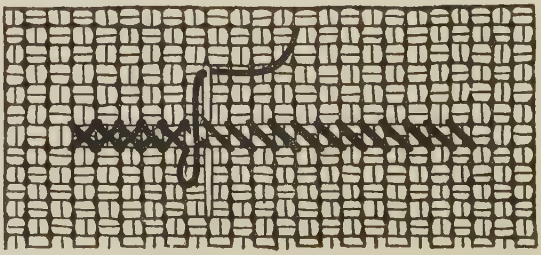
center worked with rows of canvas stitch and cross-stitching. If you try to copy it, you will be interested to find how much alike these three stitches are. Begin with the overcasting stitch and work from right to left of the canvas, or hold the strip over the first finger of your left hand and work toward you. Bring the needle up one hole from the top and one from the end of the strip and sew through every other hole to the left as the picture on this page shows.



For making the canvas stitch work from right to left, bring the needle up through the canvas, point it down through the hole to the left in the row above and bring it up through the hole just below. For the cross-stitch, make a row of canvas stitch, and then work backwards from left to right, pointing the needle down through the upper hole, bringing it up through the one just below, and crossing the canvas stitch each time. Two pieces of thin white flannel with the edges notched or pinked with your scissors, make the inside leaves of the needle book. They are held in place by a thread sewed through the middle and tied.

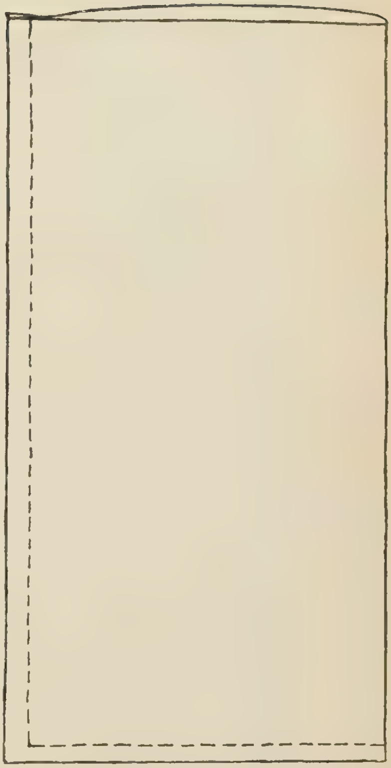
After making such a needle book you will find you can go on and invent other things to make from your Java canvas,—squares and oblongs that can be used as mats on a real table, or as table covers, bureau scarfs and rugs in the house "Where the children live." Work out different combinations of stitches in patterns of your own invention. Canvas stitch can be used in all sorts of ways. You can cover a square

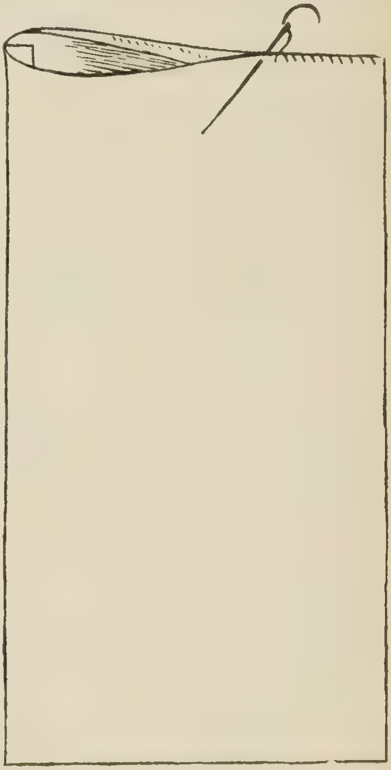


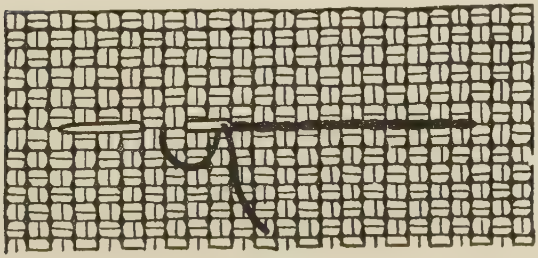


or oblong of the canvas with solid rows of it if you like.

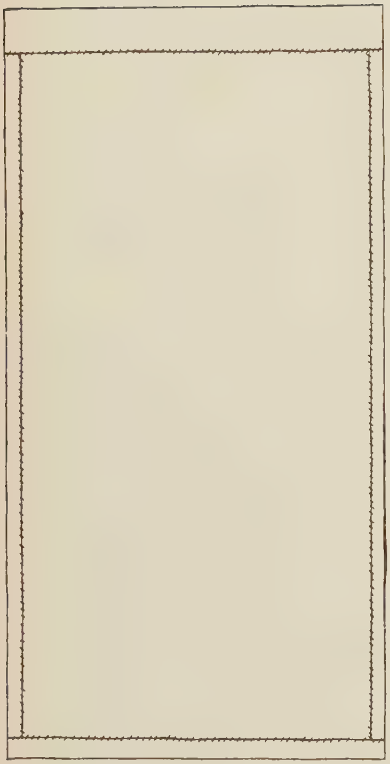
A mattress and pillow for a doll's bed are easily made and will give you practice in several different stitches. The bed clothes are interesting, too. Get a piece of real bed-ticking for the mattress if you can, or make it from some other strong material. Fold it double on the wrong side of the cloth, and cut it a little longer and a little wider than your bed. This will allow for the seams, and also for the "stuffing" which takes away something from both the width and the length of the mattress when it is put in. Baste the edges together across one end and along the side, with a strong thread and long stitches. Use even or uneven basting stitch as you like. Even basting stitch is the one most often used for this kind of basting. Sew it with a back stitch. This, as you already know, is the strongest stitch we can use for seams, and the seams of a mattress need to be as strong as we can make them so as to hold the filling securely inside no matter how hard "the children" may plump themselves down on the bed. Some children even dance on the bed, as you probably know, so use strong thread and try out the stitch on a little piece of canvas first. Bring your needle up one hole to the left of the place you mean to start, point it down one hole to the right of that one, and up through the next hole to the left of it. Pull it through and point it down again one hole back (to the right), then up one hole to the left. Taking the





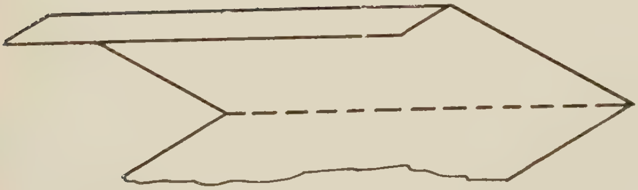


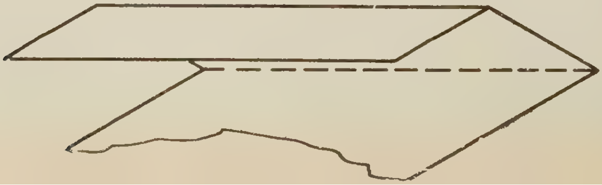
stitch shows you where it gets its name. For each time you take it you go back one hole to the right. After sewing the seam in the end and side, pull out the basting stitches, turn your bed-tick right side out, and fill it with something like cotton batting, cut up rags or excelsior. Good mattresses have been made from such things as dried leaves and hay where people had nothing better with which to stuff them, and I suppose we all know what a delicious pillow can be made from balsam needles. After filling the mattress turn in the edges at the open end as evenly as you can. Baste them together and overhand them with fine, close set stitches. Overhanding, as you already know is like overcasting with small stitches. The smaller and nearer together you can make them, the stronger and neater your seam will be. Be careful to put your needle through both edges with every stitch.

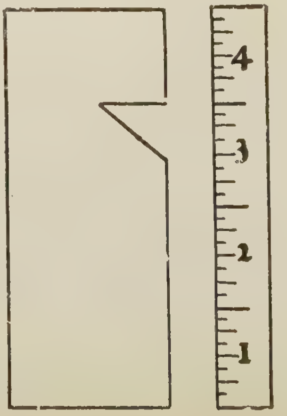


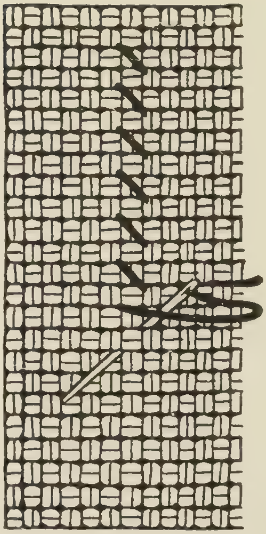
Make the pillow just as you made the mattress. It should be long enough to stretch across the head of the bed, and wide enough to give it the shape of a real bed pillow.

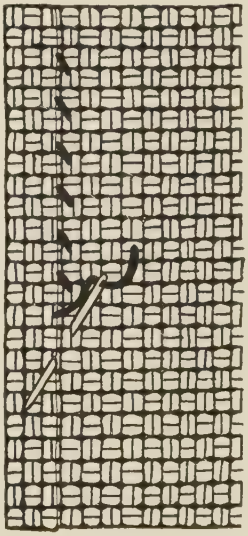
Unlike the sheets of a real bed that have the selvedge edge made by the loom at each side, sheets for a little bed like this must be hemmed on the sides as well as at each end. Make them from pieces of white cotton cloth, or unbleached muslin. Measure them and, after making a little cut with your scissors, tear them across. Real sheets are always torn instead of cut. That makes the edges straight after they are washed.







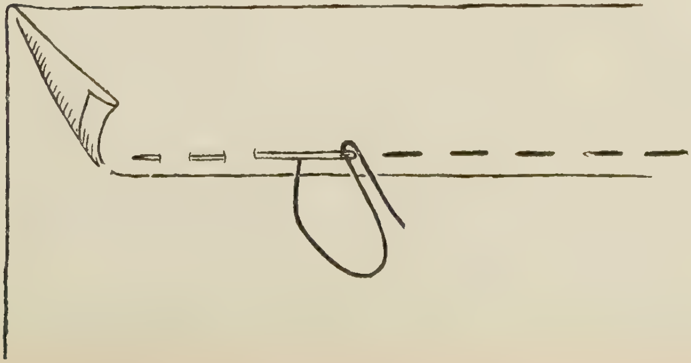


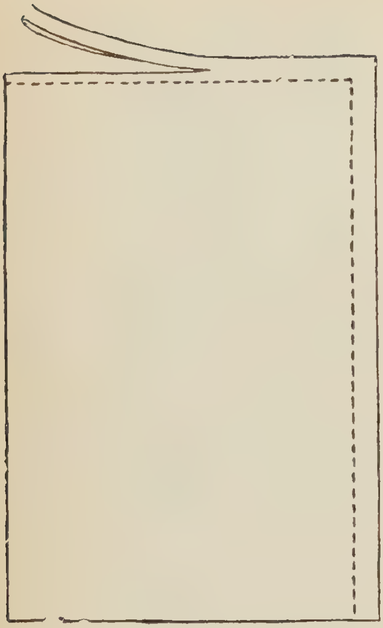


The pictures on page 312 show two pieces of paper folded and creased just as a hem is folded and creased. Notice that the narrow hem has the first and second fold made nearly the same in size. The wider hem has a second fold much deeper than the first one. Fold and crease the narrow hems in the sides of your sheet and baste them. Then turn the wider hems at the ends. The top of the sheet should have a hem much wider than the others. You might use a measuring "gage" like the one in the picture to keep it straight as you turn it. Make it of cardboard or stiff paper. When all the hems are basted, try out the hemming stitch on a piece of canvas.

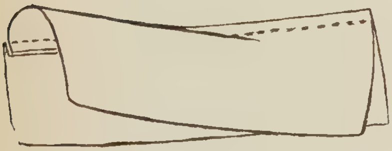
Practice it first without a hem, taking the strip of canvas over your left forefinger and working toward you. Bring the needle through from the wrong side. Point it down one hole to the right in the row below and bring it up one hole to the left in the row below that. The two pictures on this page show how the hemming stitch is taken, first flat on the canvas, then through the folded hem and the cloth beneath it. Now take your sheet and try making the same stitch on that. The finished sheet should be long enough and wide enough to tuck in well all the way round the mattress, and in the case of the upper sheet, to turn down over the top of the blanket edge.

The pillow slip should be wide enough to fit over the pillow easily, and long enough to cover the ends and keep the pillow-tick from getting soiled. A

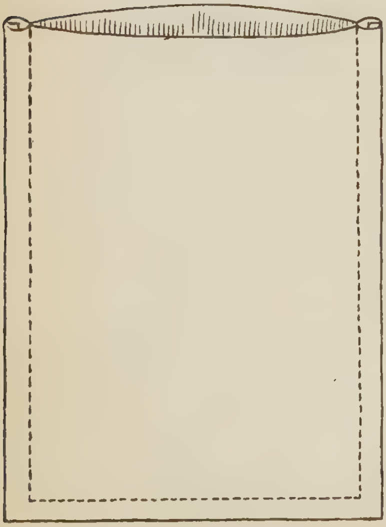




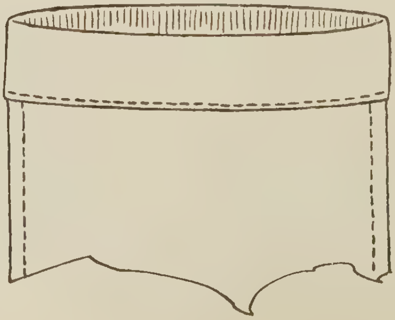
double or "French" seam is generally put in a pillow slip. Sew the ends and sides together with a simple running stitch as the pictures show. Trim the edges of the seam. Turn the pillow slip on the other side. Baste in the second seam and sew it with a fine running stitch, taking an occasional back stitch or half-back stitch to make it stronger. Put a hem in the open end of the slip, about as deep as the one on the top of your sheet. Turn the slip so the seam and hem come on the inside, and put it on your pillow.



For blankets, use a piece of flannel if you have it. If not, cotton outing flannel will do very well. If your piece is long enough, make a double blanket like the one in the picture. Blankets are generally made double and folded with one edge a little higher than the other when they are put on the bed. Finish the tops with blanket stitch. This is worked from left to right as the picture on page 315 shows. Take a canvas strip. Bring the needle up two holes from the edge, loop the thread as the picture shows, and put the needle back in the same hole bringing it up through the loop at the edge. This starts the row. Now point the needle down one hole to the right and bring it up again at the edge and through the loop. At the lower left hand edge of the sampler in the Source Picture you will see the loop stitch worked first with a long and then with a short stitch. You can make it in that way on your blanket edge if you prefer.

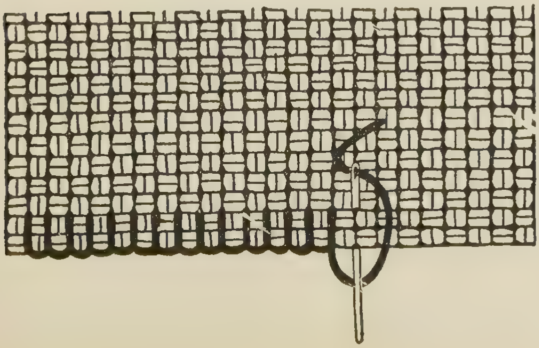


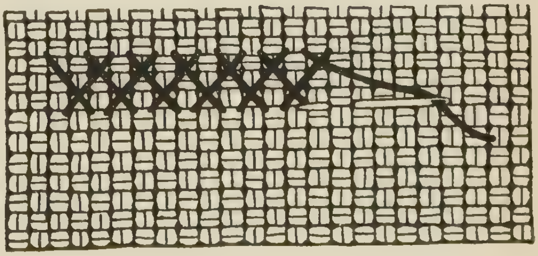
And now we surely want a bed spread to put on

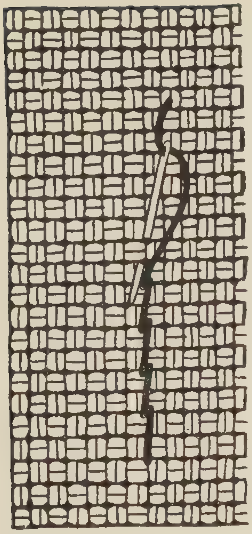


the outside of our blankets. If we make it long enough to cover up the pillow as well, it will protect the pillow case from dust during the day and at the same time cover up the wrinkles and creases that are sure to come after the pillow has been used. The bed spread can be made of colored cloth. The one shown in the picture was made from a piece of unbleached muslin, with catch stitching in color on the hem. Baste in your hem all the way around the spread. Make it rather narrow, and turn it up on the right side, for unlike most hems, you will want it to show as much as possible and make a border. To make the catch stitch, take a canvas strip, begin at the left and work toward the right as the picture on this page shows. Bring the needle up from below and point down through the hole three holes to the right and three rows below. Pull it through. Bring up the needle one hole to the left in the same row, and point it down three holes to the right and three rows above. Bring it up again one hole to the left in the same row. Continue in this way. Take care that the thread hangs always at the same side of the needle so that all the stitches cross each other in the same way, from left to right or from right to left, as the case may be.

And now how would you like to make some doilies to use when you give a tea party? Your Hy-San Table makes a fine tea table as you have probably found out for yourself. The doilies and tea napkins in the pictures on page 307 were made from unbleached

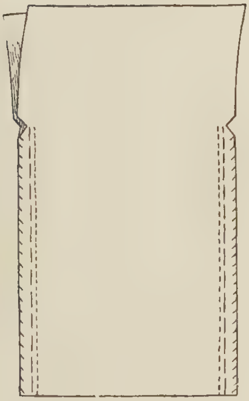




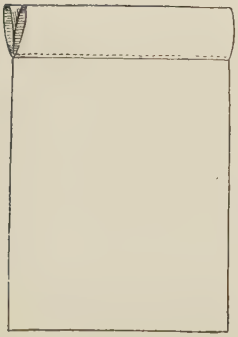


muslin. They have nice hems, about ¼ inch deep, basted in them all around the edges. They are sewed with blanket stitching. A soft yellow shade of mercerized cotton thread was used, and a "lazy daisy" was worked in one corner of each, just for fun. The pictures show you how to make one. It can have as many petals as you choose.

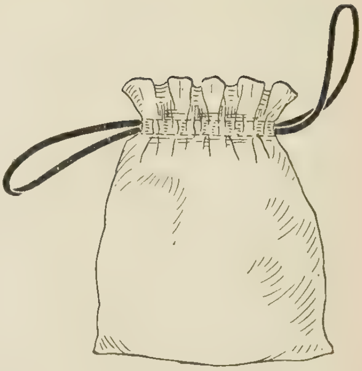
A bag is always an interesting thing to make and a useful present if you make it well. The little button bag at the right hand side of the Source Picture was made of unbleached muslin, but the same pattern of course can be used for all sorts of materials. The word "Buttons," embroidered on it, was marked first with a lead pencil and then outlined in Kensington stitch, before the sides of the bag were sewed up. In Kensington stitch the needle backs away from you instead of working toward you or from right to left or left to right as other stitches do. The needle is brought through each time so that the last stitch shall overlap the one before it. On your canvas point your needle down through every third hole and bring it up through the second hole each time as the picture on this page shows. When we are working on close woven cloth we can make the stitches longer or shorter as we choose, but long or short they should overlap. It is better to use short stitches for outlining letters.

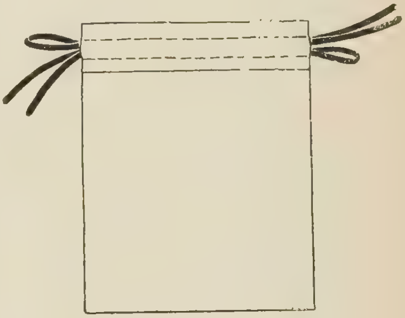


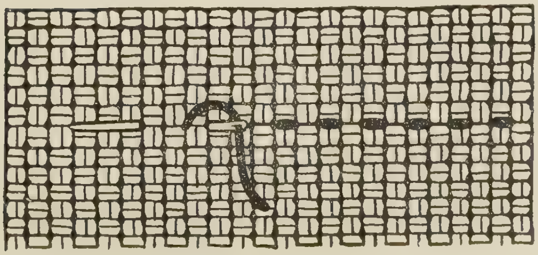
Cut your bag the length and width you wish. Allow plenty of material for the deep ruffle at the top and make a notch in each side to mark the place where it begins. Sew the bag from the notches on the sides

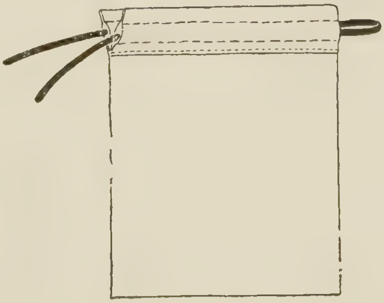


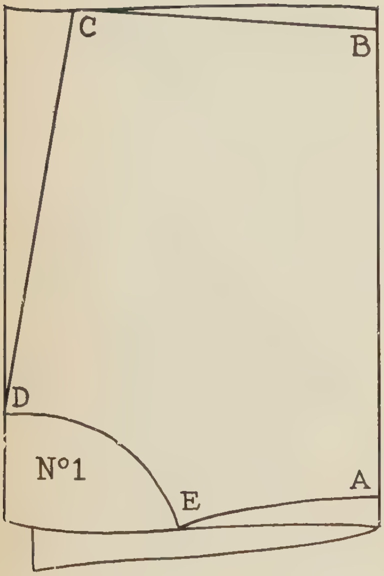
to the bottom using a half-back stitch. The half-back is a good stitch for the seams of a bag. They need to be strong but do not have the strain put on them that the seams of a pillow or mattress have to stand. Start on your canvas as in the back stitch, bring the needle up from the under side, pointing it down through the hole to the right and bringing it up again two holes to the left as the picture shows. But instead of bringing it all the way back to the first hole, we bring it only half way back, point it down again one hole to the right and bring it up two holes to the left. This is repeated to the end of the seam. The half-back stitch works along more quickly and is less clumsy than the back stitch. Baste the edges of your bag together with a line of basting stitches set an even distance from the edge. They will help you to put the seam in evenly. When the seam is finished overcast the raw edges neatly together, to keep them from fraying. Fold back the edges from the notch on each side to the end of the cloth and turn down the big hem at the top of the bag. Baste it in place. Hem it or sew it with a fine running stitch close to the edge. Half an inch above put in another row of running stitch. This makes a casing to hold the strings when we run them through with our tape needle or bodkin. Make them of narrow ribbon or tape. Run the first draw string through the casing on both sides of the bag. Sew or tie the ends together, and put the second string





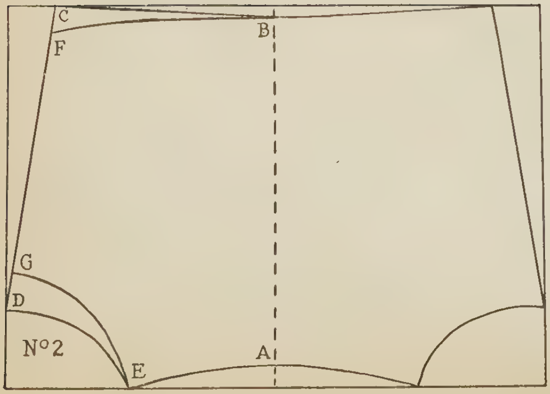


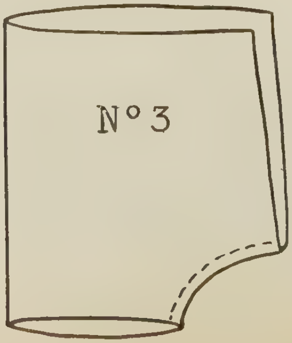




through from the other side. With your needle and a short thread put in a few "blind" stitches to catch the sides of the deep hem together and keep the raw, turned in edges from showing.

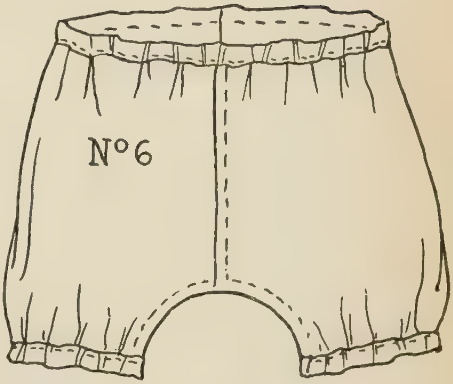
If you wish to make doll's clothes it is a good plan to begin with a pair of bloomers. They can be made of soft finished white muslin or cambric, or of colored material to match a dress. Fold a sheet of paper through the middle and cut the pattern (No. 1) that you see at the side of this page. The line A, B should be about 2½ inches longer than your doll, measured from the waist to the knee. That will allow for finishing and bagging at the knee. A, B makes the fold at the side of the leg. B, C the line at the waist. C, D the seam through the seat. D, E is the leg seam, E, A the bottom of the leg. After pattern No. 1 is cut, open it out and shorten the front by cutting away the pieces C, B, F and D, E, G. Baste and sew the leg seams together as the pictures show—then make the seam through the seat. These seams can be made with one of the combination stitches, two or three running stitches and a half-back stitch to make the seam stronger. The raw edges should be overcast. A neater way, of course, is to make French seams. If you do that be sure to finish the leg seam, sewing it on both sides, before you sew the seam in the seat. Be careful, too, to sew the seam in the seat on the right side first. Fold over the edges around the top and at the bottom of each leg, to make hems. They should be deep enough to use as casings through which

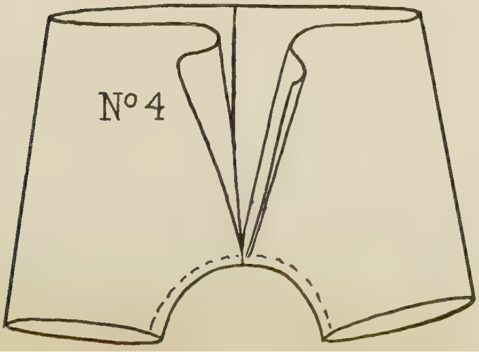


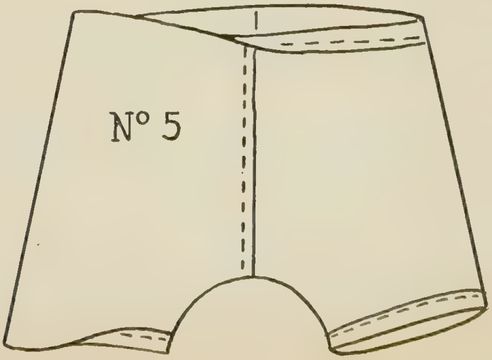


to run narrow elastic. The hem can be sewed in with running stitch instead of hemming stitch if you like. Open the seams enough to slip the tape needle with the elastic through, and sew the ends of the elastic firmly together.

The kimono pattern is the best one to use for your first doll's dress. The pictures on page 320 show how to cut it. First take your tape measure and measure your doll from the top of her shoulder to a point half way below her knee. Cut a piece of paper twice as long and half as wide. Double it over and draw your pattern on it (Fig. 2). The lower edge of the sleeve, F, K, should be about ¼ of the distance from B to C. Shape the sleeve by cutting away the piece E, B, F. Shape the bottom by cutting away the piece C, D, L. Cut out the neck G, H, J. Fold your cloth length ways. Open your pattern and lay the straight edge G, D on the fold of the cloth (Fig. 3). Pin it on carefully and cut out. Slash the back fold about ⅓ its length (A, to B). Take off the pattern. Open out the dress and fold it over matching the sleeve and side seams together (Fig. 4). Baste or pin the seams together. Sew them on the right side with running stitch about ¼ inch from the edge. Trim them with the scissors and make a tiny slash at the point O and P. Turn the dress on the wrong side. Make your seams into French seams, basting them and then sewing them with a combination stitch. Try the dress on the doll. Trim the edges of the sleeves if too long, and plan the exact length of the skirt. Turn up and baste the hem in the bottom of the skirt. Cut







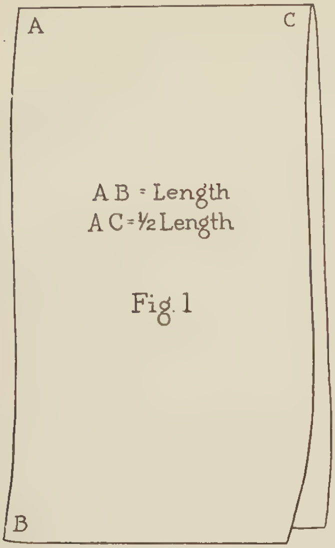


Fig. 1

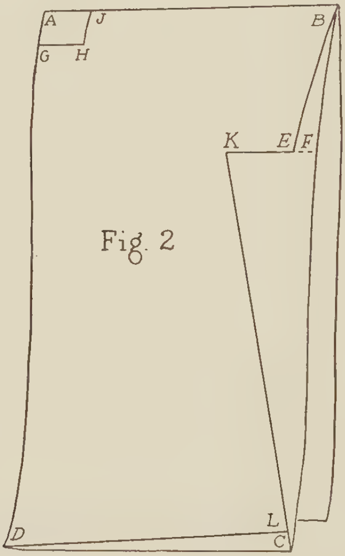


Fig. 2

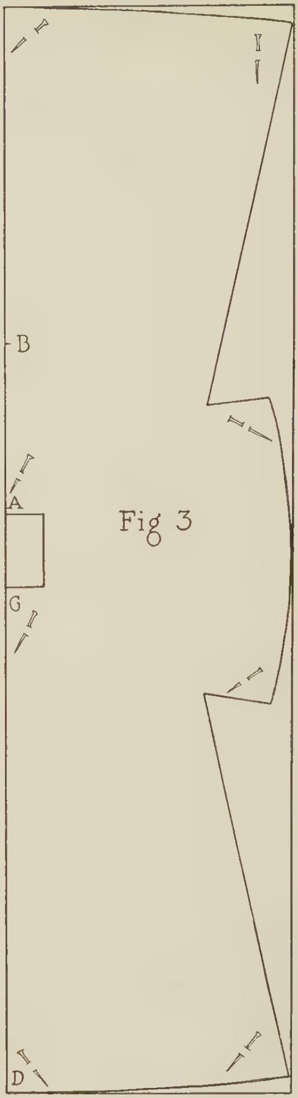


Fig 3

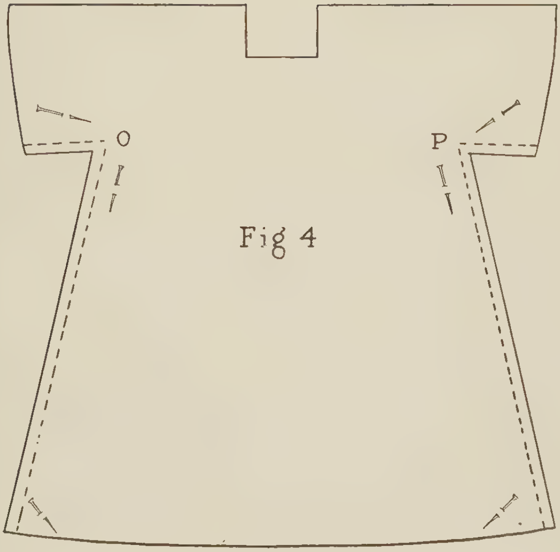
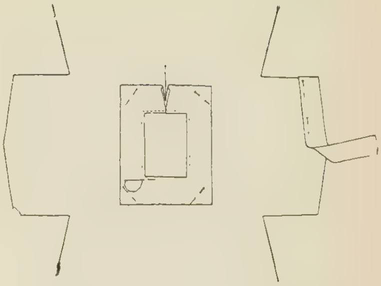
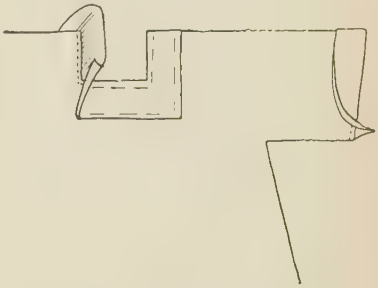
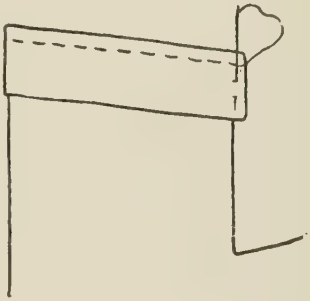


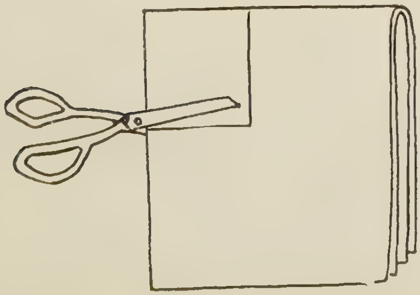
Fig 4

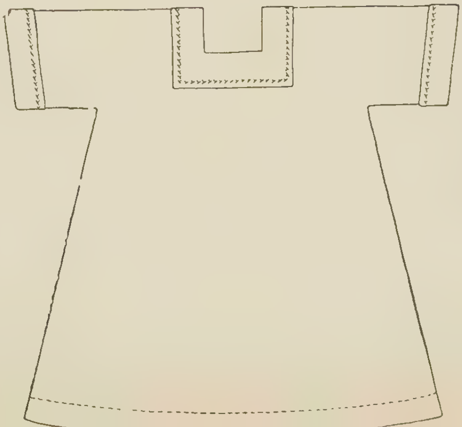
facings to finish the bottom of the sleeves and the neck. The sleeves may have a hem basted in them if you prefer. The facings can be made of the same material as the dress or they may be made of white or a contrasting color, and used on the right side as trimming. Cut a square neck facing and cut away the center to fit the neck of the dress. Pin it in place, cutting it through at the middle of the back where the dress has been slashed. Sew it around the neck close to the edge with running stitch. Turn it over on the right side and baste around the top. Turn in the lower edges and baste them flat to the dress. Hem them down or hold them in place with a fancy stitch of some kind. If the sleeves are faced, sew the facings to the edge on the wrong side. Turn them over on the right side, and then hem them down, or put in a fancy stitch as at the neck. Now finish the slashed opening at the back with a placket. To make this, cut two straight strips of cloth a little longer than the opening. Make one about twice as wide as the other. Sew the narrow strip to the right hand side of the opening as the pictures on page 322 show you. Fold in the ends and fold it back like a facing on the under side. Turn in the edge and hem down. Sew the wider strip to the left hand side of the opening. Crease it length ways through the middle and fold along the crease. This will make the free edge meet the edge of the seam underneath. Turn it in, and hem it down to the seam on the wrong side. This makes an extension or lap that can be fitted under the right hand edge. Stitch the two sides of the placket firmly together at the bottom and sew on a couple of snap

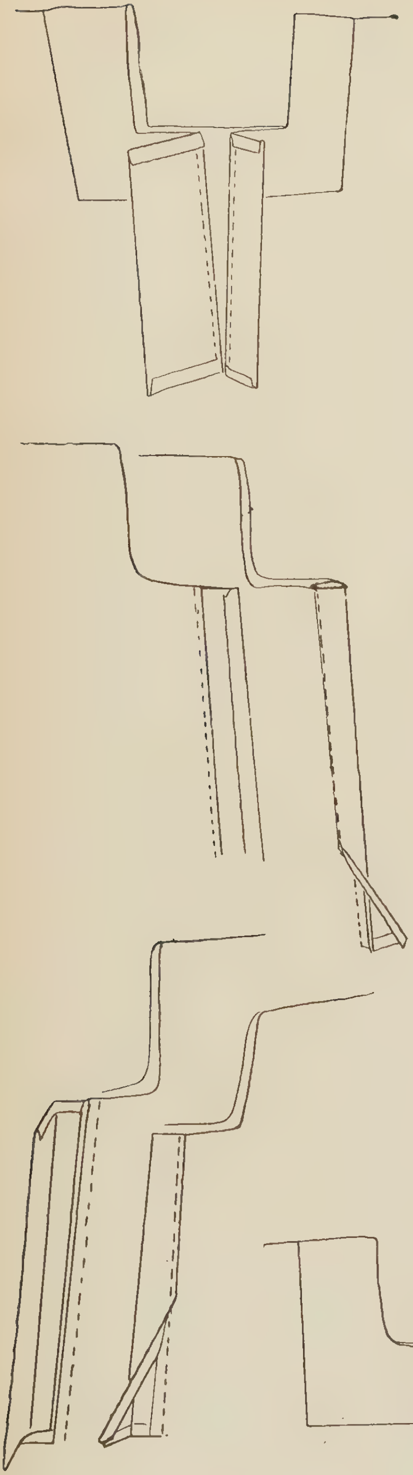










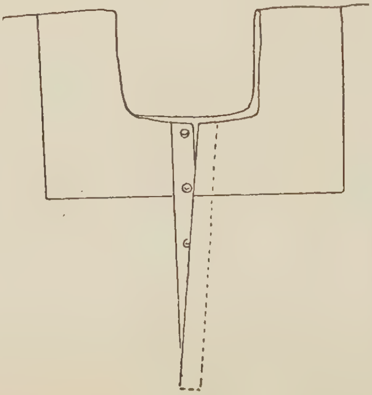


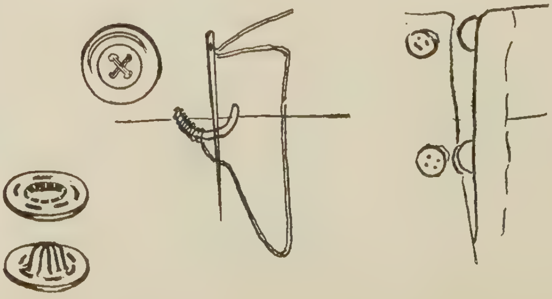
hooks or small buttons and loops to fasten the dress together. The loops can be made of strong thread doubled and worked in loop stitch as the pictures show. A row of feather stitching can be put around the facings of neck and sleeves and at the top of the hem, to trim the dress, or the colored facings can be used for trimming.

To make the *feather stitch* take a strip of canvas, hold it over your left forefinger and work toward you. Bring the needle through from below. Point it down one hole to the right and bring it up through the one directly below the first hole. Let the thread loop around under the point of the needle and hold it with your thumb. Pull the needle through. Point it down to the left and bring it up through the hole in the row below, directly in line with the first one. With each stitch the needle is pointed down one hole to the right or one hole to the left of the middle row through which it is brought up. The thread is looped around under the point each time and held with the thumb.

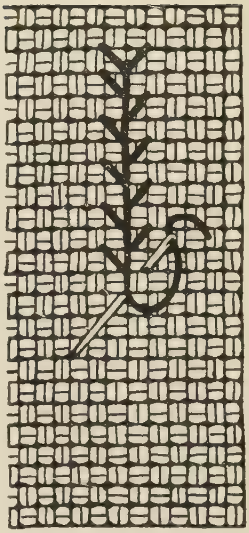
Does all this sound as if making a doll's dress might be a good deal of work? Let me tell you a secret,—a girl who can make such a dress for her doll, can make a dress for herself in just the same way. Try it! Use some pretty cotton material,—gingham or print with a soft finish is easy to cut and sew and costs very little. Measure as you did for the doll's dress, from the top of the shoulder to half way below the knee, and get a piece of material twice as long as that.

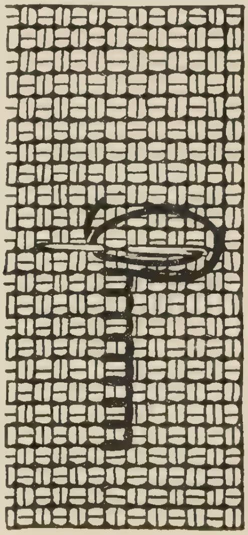
But when it comes to making something you your-

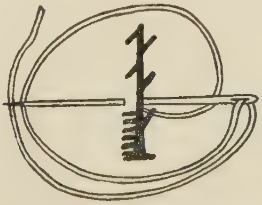


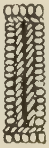


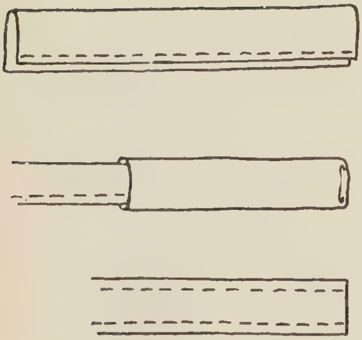
self can wear, perhaps you had rather begin with something more simple than a dress. A work apron is always useful. It can be made in all sorts of ways. Indeed you can easily invent your own pattern for it. The two you see in the pictures on page 324 were invented by children. The edges of both are hemmed all the way around. They could be trimmed with feather stitching, catch stitching or blanket stitching. The straps are made double, sewed together on the wrong side, turned and then basted flat at the edges, as the pictures show. The ends are shaped in points. Buttons and button holes are used to hold them in place. Make a straight cut with the points of your small scissors for the button hole. It should be long enough for the button to slip through easily. Use a strong thread and overcast the edges as you see in the picture at the bottom of this page. The *button hole stitch* is the hardest of all those on the sampler in our Source Picture. Practice it on a strip of canvas first. Take the canvas over the left forefinger. Bring the needle through to the right side two holes from the edge. Pass it over the edge and point it up through the same hole again. Take hold of the thread about two inches back of the needle's eye and loop it around the point as the picture shows. Pull the needle through and draw the thread tight. Use your left thumb to keep the stitch at the edge of the canvas. This starts the stitch. Work from you. Point the needle upward through the next hole back, and loop the thread around it as before. Pull through and draw tight, keeping the stitch at the edge of the canvas by guiding





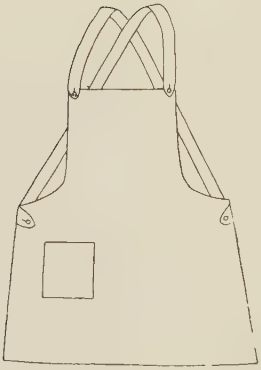


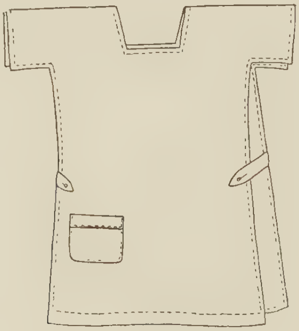




it each time with your thumb. Working a button hole so that it is even and looks neat is something that can be learned only by practice, so do not be disappointed if the first one you make is uneven. It is a good plan to make several on a scrap of material before you begin on your apron straps. As the strap is double, practice your button holes on material that is doubled. The over casting stitches will hold the two thicknesses of cloth together.

People who know how to make good button holes enjoy making them. And that is true of everything we do with our hands. We love to do the things we can do well. When we are learning to sew we enjoy the things we make. When we can sew well, we often love the sewing just for its own sake.





CHAPTER XXII

With Color and Brush

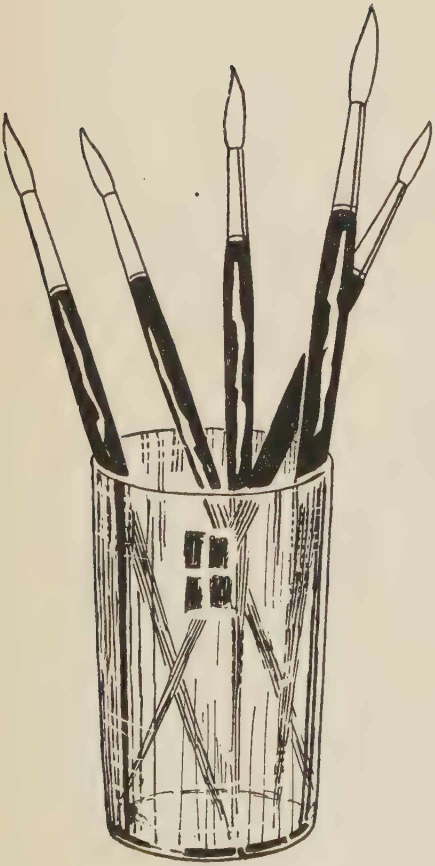
The flowers and leaves on Source Picture Number 22 are of a very different kind from those we saw "In the children's garden" on Source Picture Number 9. They were very much conventionalized. These are realistic. They are portraits of the flowers they represent, and as life-like as the artist could make them. Flower pictures of this kind give people so much pleasure there is a constant demand for them everywhere, and artists are always busy making new ones. Some artists paint only flowers, just as some others make a specialty of landscapes, or people, or animals, or birds.

The tulip on the Source Picture may remind some of us of the famous painters who used to live in Holland long ago. They painted things to look as real as they could make them, and they often painted tulips, for the tulip is a favorite flower in their country. For many years the Dutch people have grown it in their gardens and worked to make it more and more beautiful. Millions of tulip bulbs are sold in Holland every year, and sent all over the world for people to plant in their gardens and enjoy.

It is the florist who makes it his business to grow and sell flowers as you know. The man or woman whose work it is to improve plants, to cultivate them so they will bear more beautiful flowers, or larger, sweeter fruits, is called a *horticulturist.* No doubt you have heard the name of Luther Burbank. He was a famous horticulturist.

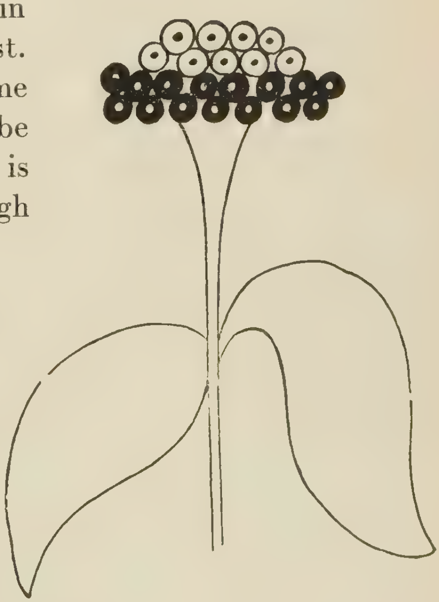
In Japan people have cultivated and improved the iris very much as the Dutch people have cultivated their tulips. In France, too, the iris has always been a favorite flower. The French call it fleur-de-lis or "lily flower." Its conventionalized shape is one of their favorite design units. Indeed in old days it used to be their national symbol. They used it for their flag, which was a white one, and had on it the fleur-de-lis in gold. When you hear or read about the "golden lilies of France" it is this fleur-de-lis symbol that is meant. Like the flower from which it came, it is most graceful and beautiful in shape and is a favorite design unit today all over the world.

In one of our busy American cities there is a house where two beautiful flower pictures hang on the walls, and give pleasure to the people living there. One is a picture of tulips, painted very carefully by a Dutch artist of long ago. The other is a picture of iris, painted by a Japanese artist, with big sweeping strokes of the brush and lovely delicate colors. The Dutch artist tried to paint every little detail of his flower. All the little veins in the petals, the tiny shadows, the brilliant flecks of sunshine that make "high lights," as artists call them,—he put them all in his picture. The Japanese



artist, on the other hand, was interested only to give the effect without painting the little details. Yet his picture is as lovely, and gives people as much pleasure as the tulip picture, and his method of flower painting is the one we should try to follow, at least when we are just beginning to make flower portraits. For to paint a flower in detail is a very hard thing to do. Small as it is, a flower is often put together in a very complicated way. Its colors, too, are complicated, if we try to imitate them with exactness. But we can get the effect of the flower quite easily, if we think only of the important things about it,—its special shape and color, the position of its stem, and the shape and position of its leaves.

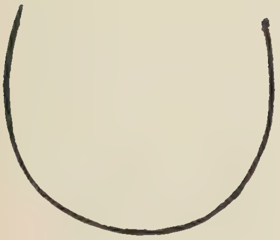
Try making the picture of a zinnia flower on your drawing board and see how simply you can get a realistic effect sometimes. Follow the outline drawing on this page and make two rows of yellow balls across the top of the flower head for the center leaves. Then make two longer rows of red balls for the leaves about the edges. Go over the yellow balls with red and the red balls with yellow, pressing lightly with your crayon. Make some more orange than red, and some more yellow than orange. Draw the calyx, stem, and leaves in yellow and fill them in with the yellow crayon first. Then go over some parts with green crayon, and some parts with blue. When you have finished you will be surprised to see how real your zinnia looks. That is because the shape is a real zinnia shape, even though

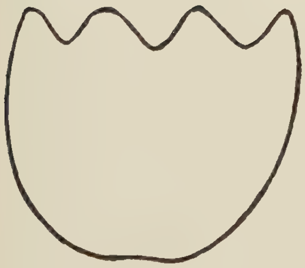


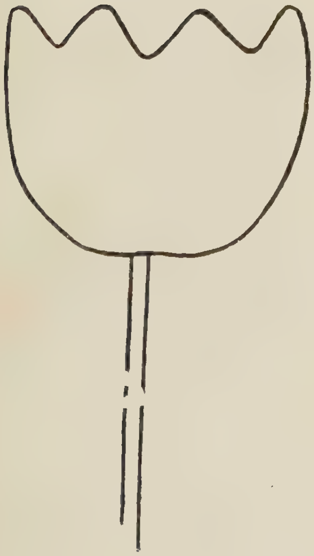
drawn so crudely. Then, in coloring it, you have given a realistic effect by using what is called "broken color." Those are the two things a beginner needs to remember. He must know and be able to draw the characteristic outline of his flower, and he must put on his color in a natural way "Broken color" is the best way to get a natural effect.

The flower outlines on the different pages of this chapter will show you how the flower artist goes to work to map out his flower before painting it. The outlines remind us a little of the animal outlines "Aunt Harriet" used in Chapter XV. As you see they begin with the most important line each time, and they seem to "bound" the flower, giving you its width from top to bottom and from side to side. Practice making these outlines with crayon on your drawing board, and make up others from different flowers. Sometimes it is very hard to make a satisfactory outline of a new flower. Holding it before a light and studying its shadow is often a help. Some people make blue prints of flowers and their leaves and get their outlines from the blue prints. Making a paper cut-out is often a help, because when we cut the flower picture in paper we have to forget the details and use only the most important lines. The cut-out of a daffodil on page 337 makes this plain.

Many children begin to paint flowers by drawing the outline in pencil first and filling it in with color. They do this, generally, because they have never learned to



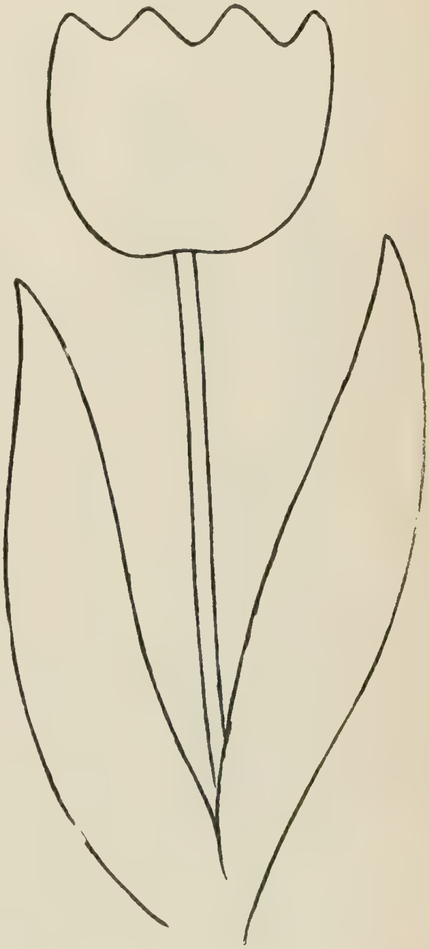




draw with their brush, or because they believe that drawing with a pencil or crayon will be easier. But they are mistaken. If you know how to make the characteristic outlines of your flower, and are used to drawing with your brush, you can do better by painting in the outline, and filling it in with color while it is still wet. So practice the flower outline on your drawing board. Make it life size with your crayon. Draw it with your brush also. Then you will have no trouble painting your flower without the help of a pencil sketch.

To draw with a brush successfully you need to have one that will "take a point," that is, one that you can draw to a point with your fingers or by rolling it over when it is wet. Many paint brushes in the stores will not do this, and many more in homes and schools refuse to do it, after children have been using them a little while. Perhaps one of the first rules we need to learn in painting is that a paint brush is not a scrubbing brush. Many children do not seem to know this when they first start to paint. They do not realize, either, the importance of caring for their brushes. A good brush is an important tool and deserves the right kind of care. Wash it clean when you are through using it, draw it to a point, and stand it on the handle end in a jar or glass. Then it will be ready to do its work next time.

When you are painting you will find it convenient to have your Hy-San Colors mixed with water in a muffin tin, like the one you see in the Source Picture. A six-

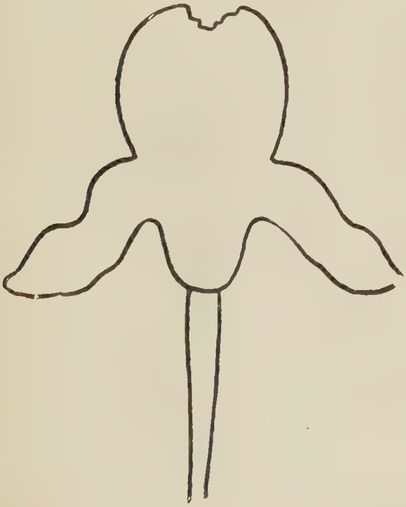


muffin tin will hold all your colors with the exception of black or white. An eight-muffin tin will hold them all, and give you an extra pan that is often useful. In addition you will need a water cup, and a china plate or saucer, that you can use for mixing your colors, very much as an artist uses his palette when working with oil paints.

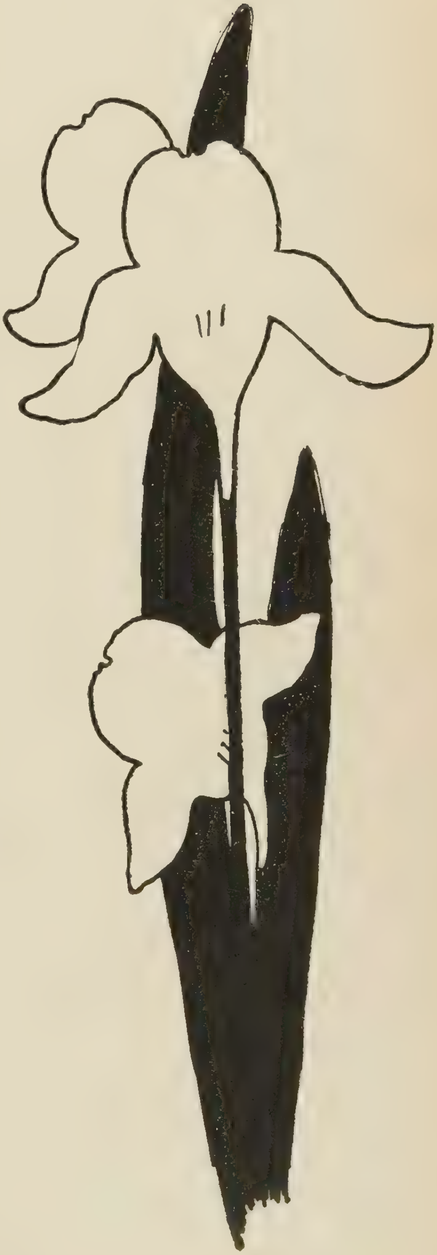
When people paint flowers with water colors they generally do it in one of two ways—either they take more than one color at a time on their brush, and paint the flower with its different color shadings in a single wash of "broken color," or they use two washes. They paint the flower in first in a light color and later, while the first wash is still damp, they paint it over with the darker colors—"drip them in," as they say.

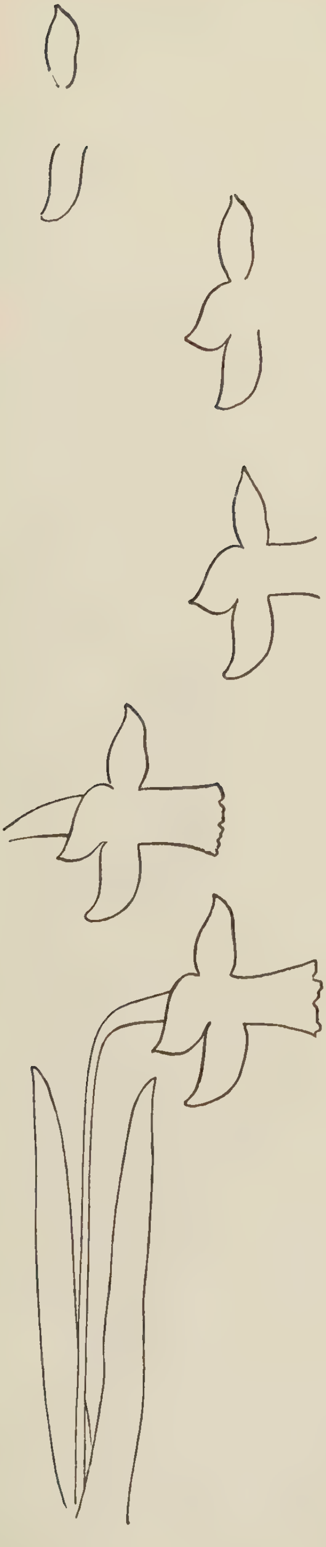
The two pictures of the tulip on the left hand side of the Source Picture show you a flower painted with two washes of color. The light yellow and the light green have been painted in with the first wash, giving us the shape of flower, stem and leaf. In the second picture the red has been painted in over the damp yellow wash, and has spread or run through it because of the dampness. Little touches of darker green have been added to the stem and leaves in the same way.

The best plan for a beginner, however, is to use a single wash of broken color. When you try this, take plenty of water and rather a large brush, for the painting must be done quickly. Suppose you are making a red and yellow tulip. You will want to use both red



and yellow. But if you dip your brush into the red paint in your muffin tin, and then dip it into the pan with the yellow paint, you will surely leave some red paint mixed with the yellow. This will spoil it later on, when you need a clear yellow for some other purpose. That is why you need the china plate. By using it you can take out enough red and enough yellow from the separate pans of the muffin tin, to paint the whole flower. Then you can dip your brush first into one and then into the other, without caring if the colors mingle. So prepare your plate as an artist prepares his palette, by putting on it a little of each color you expect to use. Dip your brush first into the red then, quickly, into the yellow, and very quickly put it on your paper, painting in the outline of the tulip with the point of the brush. Then use the side of the brush to fill in the petals. Do this quickly while the outline is fresh and wet. If it should dry the paint will not mingle, and the line will show in the petal of the finished flower. After you have made a stroke do not go over it again, as that will spoil the fresh color. In the Source Picture the brush at the left side of the muffin tin is doing this kind of painting. The brush at the right side is painting in a flower stem. This of course must be done with the point, just as an outline is drawn. To paint the leaves and stems of a flower with broken color, you dip your brush into the blue and yellow paint, just as in making the flower you dipped it into the red and yellow paint. You can use your green paint with yellow or with a little





blue, if you prefer. Choose the colors that give you a green most nearly like the green of your flower.

Not the least important thing in flower painting is the proper painting of the leaves and stems. Beginners sometimes neglect these, as they think the flower so much more interesting. If you will notice the studies in your Source Picture, however, you will see the stems and leaves have been arranged to make a real part of the picture, even if they are not the most important part. It is good practice sometimes to try painting pictures just of leaves and stems, or of grasses. Draw them in with your brush and try to make the different parts look as if they really belonged to each other—as if the leaves really grew from the stems, and were not just "tacked on" to suit our convenience in the picture. A spray of pussy willow makes an interesting study of this kind. Each little gray "pussy" really belongs on the hard, stiff twig, and needs to be drawn in a way that shows she does.

One of the things we soon find it necessary to do is to paint a leaf so that it "curls over." Look at the holly spray on the Source Picture and see how this is done. The effect is gained partly by the way in which the leaf is drawn, and partly by the different shades of green used for the upper and under sides. Are these differences imaginary, or are they really true of a holly leaf? Are they true of other leaves?

Another puzzling thing about drawing flowers is the arrangement of the outlines so that the flower "looks down" or "looks up" as the case may be. Look at the picture of the cone flower and notice the way its high center rounds up from the petals, and how the petals have been drawn to give the effect of "looking up." Suppose you were standing close to the place where it was growing and looking down on it. How would it look then? Can you draw it that way? How would you make the center, and how would you arrange the petals? On page 339 there are two pictures of a poppy. One looks up and one looks down. Try drawing some like them. Can you make them "look the other way"—make the one that looks to the right look to the left, and the one that looks to the left look to the right?

Sometimes you may wish to make "postery" flower paintings, just for decoration. Then you can draw the flower with heavy outlines and fill them in with a wash of plain color. The iris on page 331 was painted in that way. After the color had dried, the outlines were painted over in black with the tip of a fine brush. The effect is very lovely, but not realistic of course.

Flower painting gives people good practice in the use of color, and color is a mysterious, a wonderful thing when once we begin to study it. Not even the wisest men or the greatest artists can tell us all about it. We do know it is the light of the sun that gives objects their color, and that our golden sunlight is a mixture, really, made up of different kinds of light. When there is a rainbow in the sky we see the sunlight separated into these different kinds of light. A glass

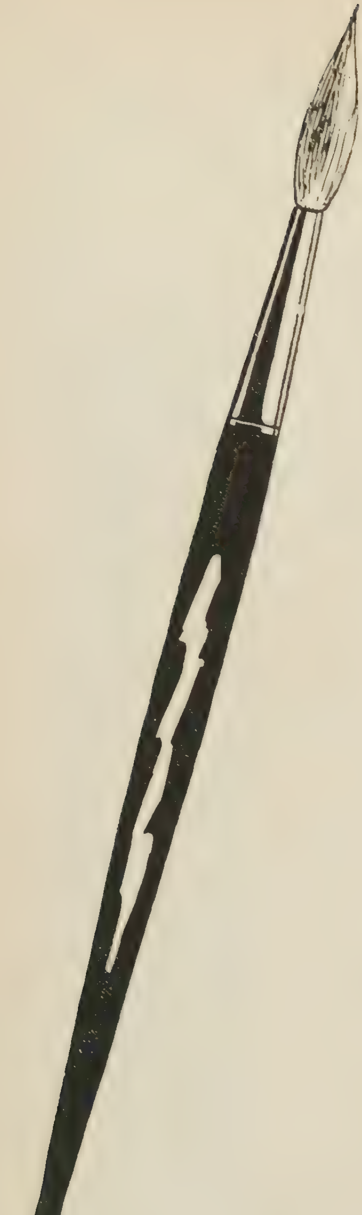
prism on the table in front of you will separate them in the same way, if a ray of sunlight falls on it at a certain angle. There are six colors or "hues" in the rainbow. Do you know them all? Red, orange, yellow, green, blue and violet are the names that have been given to them. Sometimes we hear people say "You cannot paint the rainbow"—by that they mean you cannot add another color to it no matter how hard you try. All possible colors are in it to begin with. So "painting the rainbow" is an expression that means, really, trying to improve a thing that can not be improved.

When sunlight strikes an object like a flower, some of it is taken in or absorbed, and the rest is reflected. It is the reflected light that gives the object its color. A blue flower, for example, drinks in all but the blue light. That is reflected and makes the flower look blue to our eyes. When all the color is taken in and none reflected, the object looks black. When all the color is reflected and none is taken in—"absorbed," as people say, the object looks white. At least this is what people who have studied sunlight tell us when they explain the color of objects, and the reason why everything seems black at night, yet has its special color by day.

Not all the colors in the rainbow are caused by different kinds of light. Some of them seem to be mixtures of the others. The orange light seems to be a mixture of the red and yellow light for example, just as we make orange paint by mixing our red and yellow paint together. I say "seems to be," because no one knows

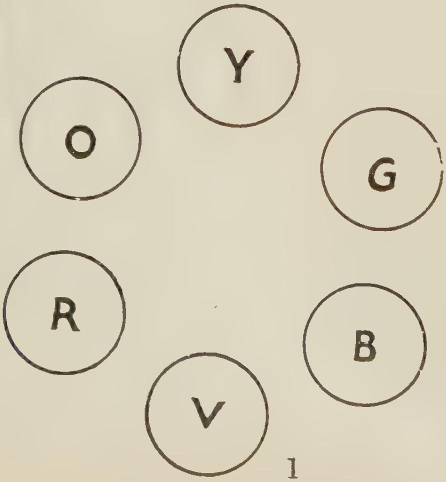
these things exactly. When we mix our red and blue paint together we make violet, but there are certain things about the violet light of the sun that seem to show it is a special kind of light, not just a mixture of the red and blue. The green light, too, seems to be a special kind of light. The green of the rainbow is a clear emerald green, quite different from the leafy green we get when we mix our yellow and blue paints together. The artist knows, better perhaps than anyone else, that there is much yet to learn about light and color, before we can be sure our knowledge of them is perfect. He knows, for instance, that if he has three colors, yellow, blue and red, he can mix from them any other color he is likely to need excepting white. To make white by combining his different colors, is a thing he does not try to do, even though he knows the white light of the sun is made up of all the different kinds of colored light combined. When he puts all the colors of his palette together, he finds they make a black or gray, as you can easily prove by trying it yourself. In Chapter XVI you will remember how Michael and Joseph learned about neutrals, and that white, black and gray are often called by that name. It is interesting to remember this in connection with what we know about mixing them. We can make gray by mixing white and black together. We can make it, too, by mixing all our colors together, or by putting complementary colors together, as we shall see.

Any one who does even a little painting soon learns



the important facts about mixing colors, how other colors can be made from the three most important hues, yellow, red and blue, the *primary* colors as they are called. Some people call green and violet primary colors as well as yellow, red and blue. That is because the green and violet light of the rainbow seem to be separate kinds of light. In working with paints, however, it is more convenient to speak of yellow, red and blue as the primary colors, and the majority of people do so.

On this page you will see a diagram that will help you when you are learning to mix colors (Fig. 1). Try it on your drawing board. Put the six circles in the position you see them on the margin of the page, and fill them in with color. The letter in each circle shows the color to use for each one. Fill in the primary colors first,—yellow at the top, red in the lower left hand circle, blue in the lower right hand circle. Then draw the lines between them, and make the triangle that you see in the diagram (Fig. 2). The three circles left outside the triangle are for the *secondary* colors, those that are made by mixing two of the primary colors together. Since yellow and red mixed together give us orange, put the orange circle between the yellow and the red one. In the same way, put a violet and a green circle between the two colors that are needed to make each of those hues. When you have colored in all three of your secondary colors draw the lines of a triangle connecting them (Fig. 3).



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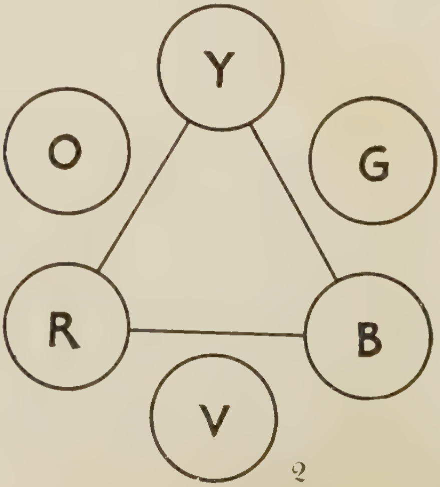

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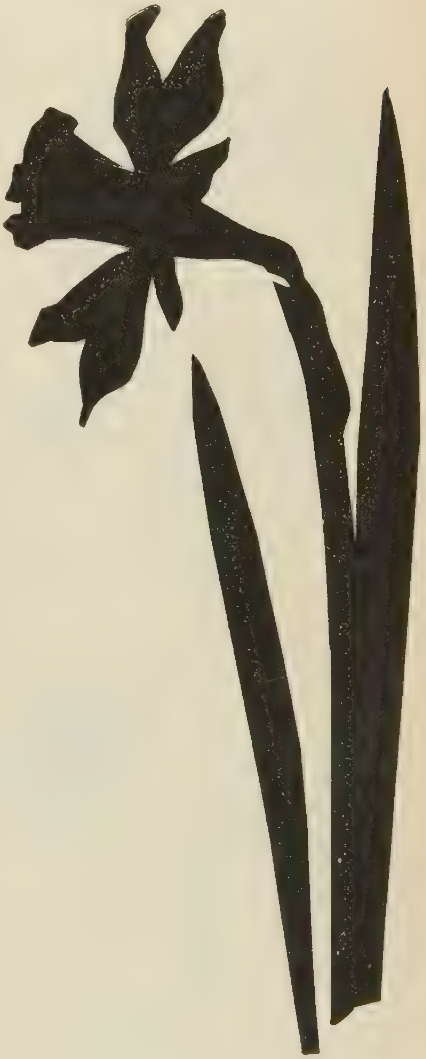
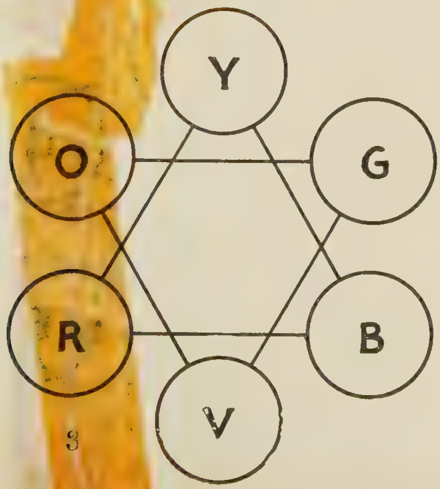
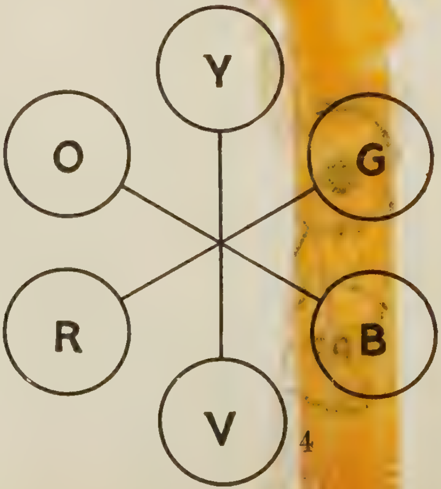
The red that we see in the rainbow is very bright. It seems neither light nor dark compared with the reds that we see elsewhere. But it is far redder than most of them. The same is true of all the hues of the rainbow. We say they are "intense" in color and, beautiful as they appear there in their place, we cannot imagine a world in which all reds, greens, yellows and other colors would be of that kind. Such a world would be confusing and tiresome to people with eyes made like our own. Most of the color that we see about us differs a good deal from its namesake in the rainbow. Either it is lighter or darker, or it has some other color mixed in with it, that changes it and makes it less intense, less red or green or blue as the case may be. Differences from light to dark are known as "values." Taking the rainbow red and mixing it with more or less white will give us reds of lighter values. Mixing it with more or less black will give us darker values. Such reds may range all the way from pink to the very deepest shade, but they will still be "red" reds,—intense or "saturated" colors, as people call them. If we mix our red with a little green, however, it will no longer be intense. It will be dulled or "grayed" as people say. Such a red will be more restful to the eye, especially if we have to see a good deal of it. Most of the color in the world about us is of this kind, the greens of the trees and grass, the browns of the earth, the blues that we see most often in the ocean and the sky. Intense colors





when we find them in nature nearly always come in small packages, like the red of the cardinal flower and the blue of the gentian. Indeed one of the delightful things about flower painting lies in the fact that the color of a flower is often vivid and intense.

But let us look at our diagram again. Notice the color of the circle exactly opposite the yellow one. It is the violet circle. Try putting a stroke of violet paint beside a stroke of yellow, and see how gay they both look. In the same way you can make the color in each circle look more vivid if you put it next to the color of the circle just opposite. Make another diagram and connect the opposite circles with lines (Fig. 4). The yellow and the violet, the red and the green, the blue and the orange will all be connected. These are what artists call the complementary colors. When used together, each makes the other more striking. They "intensify" each other as we say. But try mixing them together and see what happens. All the rich color, the bright contrast disappears in a dull gray or black, depending on the amount of each one that we use. By mixing our complementary colors together we get neutrals. When we know this we can paint pictures with what artists call "a three-color palette," one that has only yellow, red and blue paint on it. For you see, if we have our primary colors we can make our secondary colors from them. Then we can put our complementary colors together and make our own neutrals



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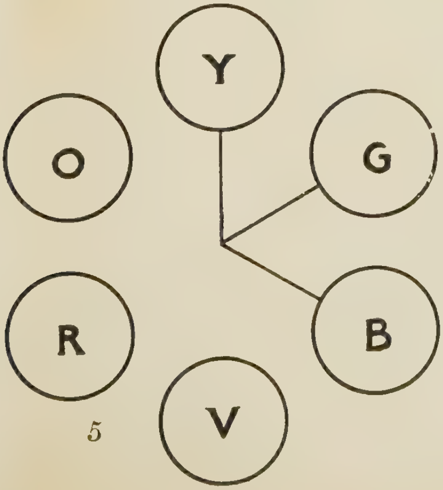
from gray to black. If we are painting with water colors we will not even need to add white to our palette, because by adding water to any color we can make the lighter values. If we put our complementary colors together, taking our blue for example, and adding just a tiny bit of orange to it, or taking our green and adding to it just a tiny bit of red, we will find we can make the soft grayed colors that we need to use for so many purposes—for the restful greens of the fields and trees in our landscapes, and for harmonious color schemes on the walls and floors of our houses.

Often we hear it said that complementary colors should be used together, and this is true when we wish to make strong contrasts and get vivid effects, as in poster making and certain kinds of decoration. But even for purposes of that kind our color plan will be more beautiful and pleasing, if at least one of the two colors is grayed. If we use complementary colors in their full intensity, we should use them in small quantities combined with neutrals—black, gray and white.

Sometimes you hear people speak of "adjacent" colors. By that they mean the colors that are near each other on such a diagram or color wheel as we have made with our six circles (Fig. 5). Yellow, orange and red are adjacent colors, and so are violet, blue and green. Adjacent colors make a beautiful color scheme. In nature we often find adjacent colors used. The blue



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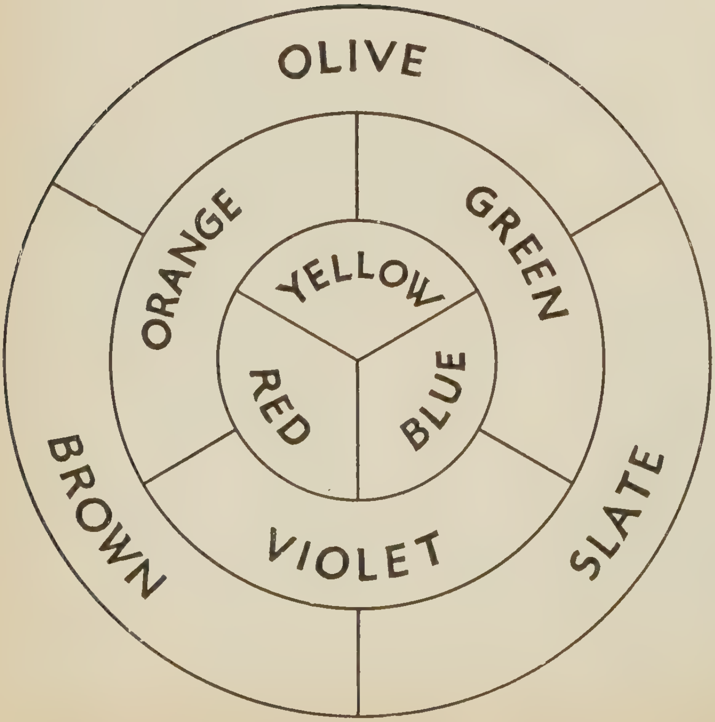
larkspur is an example. When we paint it, we need to use green and touches of violet, as well as blue. The snap-dragon, too, shows nature's use of adjacent colors. For we find the snap-dragon sometimes combines orange, red and violet. The yellow snap-dragon has orange, yellow and green in its color scheme. You may be able to think of other examples, the zinnia, for instance.

Try using all these facts about color when you are making pictures and designs. Use the complementary colors, sometimes graying them, sometimes combining them with neutrals. Use the adjacent colors and study the different effects that you can gain by mixing different amounts of the two colors that compose them—one part yellow and two parts red, for red-orange, two parts yellow and one of red, for yellow-orange, and so forth. Try sometimes making what are called the *tertiary* colors—

Olive from green and orange
Slate from green and violet
Brown from orange and violet



CHAPTER XXIII

Portraits of Our Playmates

Pictures of people are the hardest of all pictures to draw and paint. At the same time they are in great demand. Anyone who can do good "figure drawing" as it is called, will find many different ways to make use of his ability. The pictures in books and magazines show us that. By far the larger part of them are pictures of people, or pictures with people in them. Indeed, as you know, we do not have to look *inside* the magazines to learn how much they depend on figure drawing, for the vivid, postery pictures so many of them have on their covers, are nearly always pictures of people. So are the cartoons and "funny pictures" in the newspapers. Pictures of people are said to make the very best kind of advertisements, and advertisers use as many of them as they can. People interested in costume design and the making of clothing find figure drawing very important to their work as well. All these are different kinds of "illustrating," and the artists who do such work are known as *illustrators*. In addition there is a more serious kind of figure work, the work of the portrait painter and of the artists who paint pictures for the beauty and interest of the picture itself, not for the sake of having it reproduced as an illustration.

Much figure drawing is memory drawing, but artists who are skillful at it do much drawing from the model too. If we are anxious to improve our figure drawing, we can do so in all the different ways that we use to improve our drawing of animals—by memory drawing, by direct drawing and sketches from life, and by some copying, but not too much of it.

Source Picture Number 7 shows us a simple way to do figure drawing, a way that helps very much when we are first beginning. Chapter VII describes how after drawing Goldilocks, Little Boy Blue, and the rest of the Story Book Children, it is possible to go on and draw others, put them in pictures, and make them do all sorts of different things.

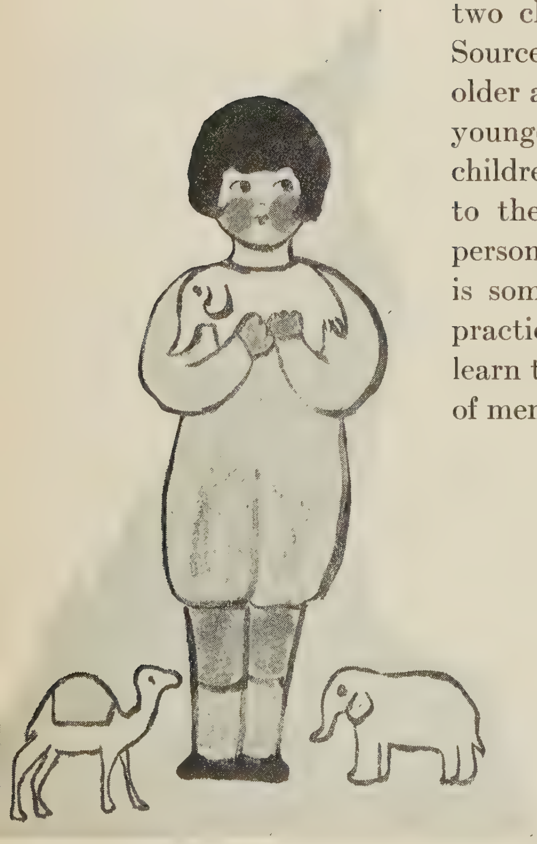
On Source Picture Number 23 you will see some pictures of children that are more difficult to draw. They are not too difficult, however, for boys and girls who have practiced drawing the Story Book Children, and who have done some simple work in drawing faces of the kind we shall talk about in this chapter. You will notice these are not pictures of Story Book Children, but of everyday boys and girls who might easily be our own friends and playmates.

The first thing we must work for when we draw people, is the shape and position of the whole figure. The name "figure drawing" tells us this. We feel the importance of it when we draw the Story Book Children. In drawing pictures of everyday children we feel even more strongly that they must look natural, "true to life"

as we say. If we draw them standing still, we want them to stand straight, and yet to look graceful and at their ease. If we draw them moving, we want their figures to show that they are moving—to "show action" as artists call it. The boy and girl who are working in their garden in the Source Picture, are an example of what I mean. The little girl is on her knees, patting down the earth around the tulip. All the lines of her body and her arms, even the way she is holding her head, help to show you what she is doing. The boy too, has his foot on his shovel, and is just ready to push it into the earth. In another minute you feel he will be straightening his whole body and pushing that shovel down where he wants it to go. His figure expresses action just as much as if we drew him running, like Goldilocks in Source Picture Number 7. The same thing is true of the boy who is holding the boat, and the girl with the pot of flowers. Although they are both standing perfectly still, the lines of their figures may be said to express action, for they are drawn in the positions that real children would take, if they were thinking and doing what these children seem to be thinking and doing. The little boy is holding his boat and looking thoughtfully ahead of him, as if he were making up his mind about something. Perhaps he sees a place in the pond just in front, and wonders whether it is the best one from which to make a launching. He holds the boat as if it were a very special one. He may have made it himself. The little girl seems to be bring-

ing a pot of flowers as a surprise to some one. Perhaps she has knocked at the door and is standing and waiting for it to be opened.

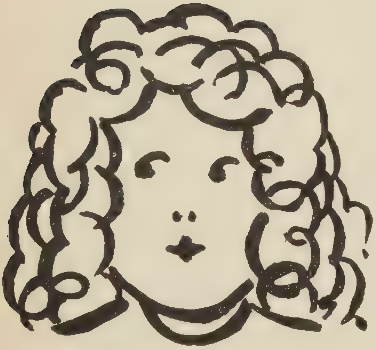
The girl with the flowers and the boy with the boat are both of the same height in the picture. You will notice, however, that the girl has a larger head in proportion to her size. This shows us that she is younger than the boy. If we could see the real girl and the real boy, we would probably find that she is shorter, too. A child's head is larger for his size when he is little, and smaller for his size as he grows older. This is an interesting thing to remember when you are drawing pictures of children. A little baby's head is larger in proportion to the size of his whole body than it will ever be again in all his life. This does not mean that his head is large, only that it looks large because the rest of him is so small. His head grows as he grows, but more slowly than the rest of him. So while these two children are just about the same height on the Source Picture, we can see that the boy must be the older and the girl younger. Both of them are evidently younger than the children in the garden, for those children have heads considerably smaller in proportion to their size than either of the others. A grown-up person's head is about one-seventh of his height. This is sometimes convenient to remember. But when we practice drawing pictures of people, we find we can learn to draw them in the right proportions as a matter of memory and experience, and not because we actually



measure them. We come to know when we draw them, whether the head is too large or too small, whether the arms and legs are long enough, and what size the feet and hands ought to be. But we need to think of these things and to look carefully at our drawings and at people, too, to see how they really look. We call it "having a sense of proportion" when we are able to tell the size things ought to be in comparison to other things.

If we can draw the figure in good proportion and with the right action, we shall be able to draw pictures of people that will give ourselves and others a great deal of pleasure and satisfaction, even if we have not learned to draw faces. On page 342 and page 344 are some pictures that will show you this. They were painted by children seven, eight and nine years old. I think you will agree that they are really interesting and worth while. We cannot see the face of the little girl in the picture with the cattails. We see only a glimpse of her white neck underneath her hair. The branches of the tree that come down on either side, make a frame for her head. She is walking away from us. Perhaps she sees a flower somewhere out in the meadow and is going to pick it. It may be that a meadow lark has started up from her nest, and she is watching it as it flies up into the sky. The little girl with the pet bird in the garden, and the little girl skating on page 344, have faces drawn just as Little Boy Blue's face is drawn on Source Picture No. 7. The children playing the

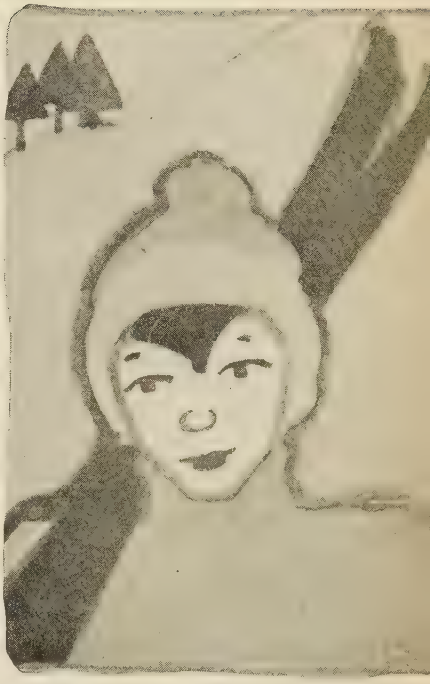
harp and violin have faces drawn in the way Red Riding Hood's face is drawn.



On page 344 you will see a skating picture that was drawn by a girl eleven years old. She first began by drawing Story Book Children. Then she went on and invented everyday children and made them do things that interested her. It must have been fun to put in those big snowflakes and give the picture the real wintery look that it has. What a nice landscape she put in the background! See how fast the big girl is skating, and how much more slowly the two little girls behind her seem to be going along?

Did you ever see a snow-ball tree? In the spring of the year and in the early summer they bloom in many old fashioned gardens. But the girl who drew the picture of a snow-ball tree on page 344 was not thinking of them. She invented a tree of her own just for fun, and a very nice invention it is. The figures of the boy and girl are very well drawn and very interesting. Their positions are very natural and full of action. But the girl who drew them did not try to put in their faces. Perhaps she did not know just how to do it, and was afraid she would spoil her picture if she did. If she had known how to make a little face like the one on this page, I think she would not have been afraid to try. The eyes are made of dots without trying to put in color or make eyelashes. The nose and mouth are just as simply drawn. The little boy with the elephant on page 346 and the little girl with the doll on

page 347 have their faces drawn in this way, and so has the everyday child in the warm winter things on page 348. As you see it is really a very good way to make a face. When you try it be careful to make the mouth small. Do not try to color the eyes or make eyelashes until you have had a good deal of experience and can make fairly good faces of this simple kind.

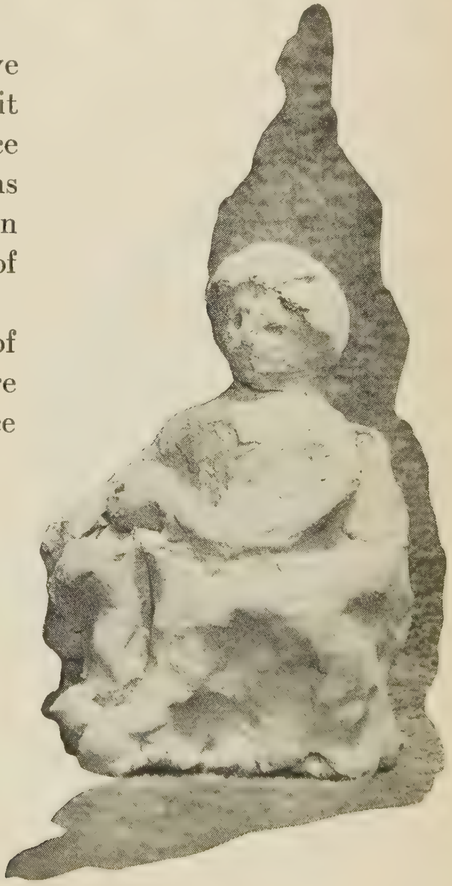


On this page and on pages 348, and 350, are some pictures that show different ways of drawing faces, especially different ways of putting in the nose which many children find so hard.

Sooner or later you will want to begin drawing the faces of special people—making real portraits. This is a much harder thing to do than drawing an imaginary face, for you want it to resemble a particular person. Some children begin by making the portrait of a doll. This is not a bad idea. A doll can sit still and pose for you just as long as you want to work, and never get tired or change expression.

In making a portrait, it is just as important to have the whole figure resemble the person portrayed, as it is to have a good likeness in the face. So we must notice the outline of the person we draw,—the proportions of the body, head and limbs, and the way that person stands and moves, as well as the shape and features of the face.

As you know portrait statues are often made of people. In such portraits the artist is always more interested in the figure and its action than in the face



and its expression. When an artist is making a statue portrait he makes it first in clay. We can make portraits of our playmates in clay as well as in crayon or paint. To be sure it may be harder to make them in clay, but it is very interesting. On page 349 there is a portrait that a little girl made of herself in clay. She was only seven years old when she made it, and she found the face very hard. But you see she succeeded very well with the shape of the head, the hair and the shoulders. You know at once that she is leaning back in her chair and has her hands folded in her lap. It is a very good attempt for anyone seven years old. Many children who are much older could not have done so well. But try yourself and see what you can do. Some people make splendid portraits in cut paper, too.

On page 352 you will see a portrait that a little girl named Patricia painted of herself. Patricia lives in Canada. She has worked very hard at drawing faces for a long time. She was thirteen years old when she painted this picture, and she won a first prize with it. It is quite a wonderful picture for a girl of thirteen to have painted, for while portraiture is the most difficult of all kinds of painting, a portrait of oneself is the very hardest kind of all. As you may have guessed, people do it by looking at themselves in a mirror while they paint. Many famous artists have painted their own portraits at different times. Perhaps you know the names of some who did so. Have you seen the portraits

that they painted, or copies of them? I think Patricia must have seen one or two. That may have given her the idea.

A portrait painter makes less use of memory drawing than other artists. In order to get a good likeness he has to study his model, his "subject" as he calls the person he is painting, very carefully. He has to draw the figure in its true proportions, and with the action that is characteristic of that particular person. He draws the head, the hair, the features of the face, and after he has done all this, he comes to what is after all the most important part of his work—getting the likeness. Getting the likeness means nothing less than showing the character of the person you are painting. It is the ability to do this that makes a great portrait painter. There are many wonderful portraits in the world today. Some were painted long ago, and they tell us more about the people who sat for them, than all the histories can tell. They show us how they dressed, of course, in the curious or beautiful costumes of their times. They show us the way they wore their hair and trimmed their beards, the jewels that they had. Sometimes their pets, their dogs and birds and horses, were painted with them. But more important than these details is the fact that their pictures tell us what kind of people they were. We can see that, though they lived so long ago, they were not different from the people we know today. Some of them were foolish. Some were wise. Some were

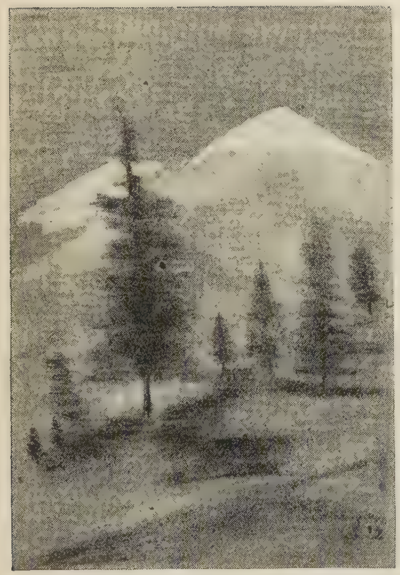
happy, and some sad. The artists who painted them revealed their characters, not because they wished to do so, but because they were good artists. They could not help showing the cruelty and the pride that are in some of those faces, any more than they could help showing the goodness that shines from others. The art of the portrait painter is indeed a wonderful art!

CHAPTER XXIV

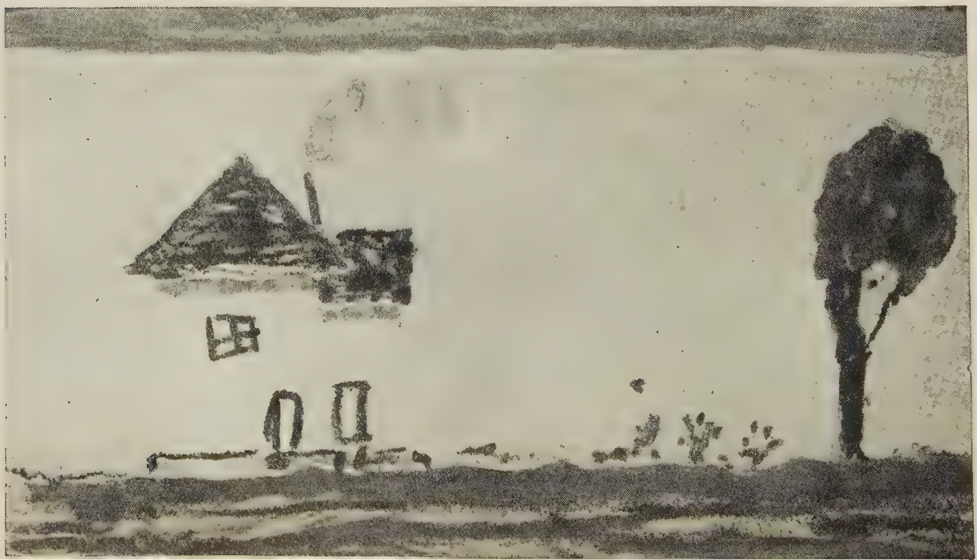
Landscapes by Little Folks

It is not as difficult to paint or draw a good landscape as it is to make a portrait, or even a good figure drawing. As you can see by looking at Source Picture Number 24, some children are able to do very lovely and interesting landscape work before they are twelve years old. Like the boy who painted the rabbits on page 187 and those other boys who drew the cows, and the pony and goat on pages 205, 207, and 208, these children have become interested in a certain kind of drawing. They must have practiced a great deal before they were able to do work like this. By drawing and painting ever so many pictures, they came to learn how they could get the different effects that are needed to make a landscape look real. Some of these are no more difficult than the effects needed for flower painting. Anyone who is really interested in drawing landscapes can soon learn how people get them.

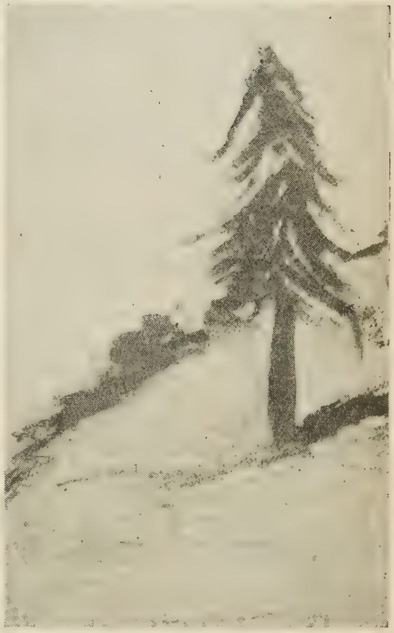
On page 354 you will see a picture that was painted by a little girl named Enid. Enid lives in India. She was five and a half years old when she painted this landscape. She called it "The Top of The Hill." Although she lives so far away, Enid made her picture just as other boys and girls make landscapes when they first start out. To be sure only a few children can paint as well as this when they are five and a half years old, and it is too bad you cannot see the lovely colors Enid put in her picture. But in some important ways it is like all the landscapes little children make. You will notice that she has painted the ground at the bottom and the sky at the top. In between there is a space that is neither ground nor sky. She just left the paper plain in that part, except for the house and the tree. Enid did this because she knows that the space all around the house and tree is filled with air. Air is something that we cannot see and therefore cannot paint. All of us do this when we begin to paint landscapes. We leave the air space uncolored between the ground and sky. But after a while as we grow older, we are not satisfied with that plan. We paint our pictures without a middle air space, and divide the whole picture between the earth, with the objects on it, and the sky. The part of our picture where the earth and sky come together we call the "sky-line."



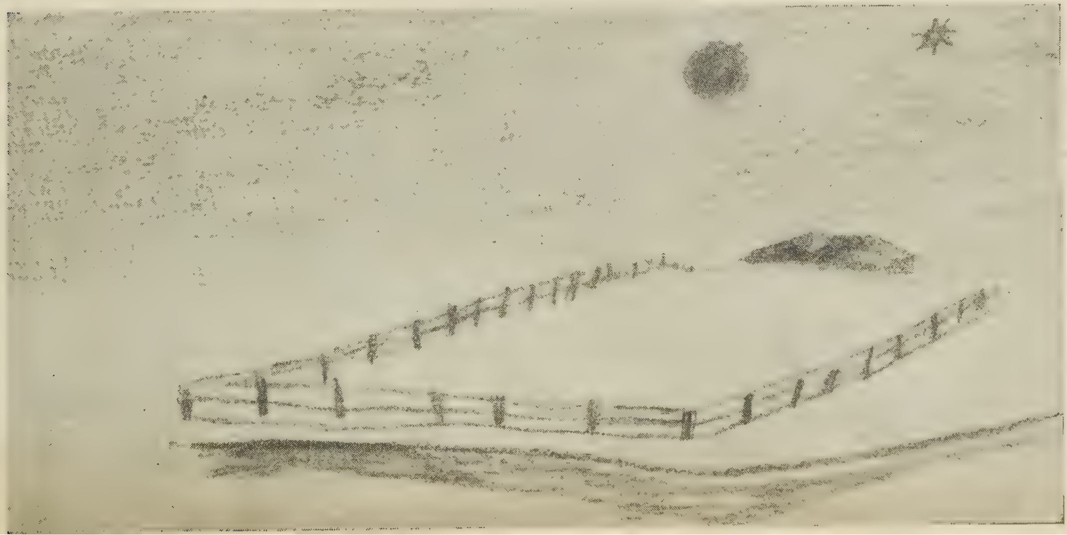
It is interesting to compare different landscapes and see just how the artist has arranged his sky-line, and divided his picture in doing so. On page 355, you will see a picture drawn by a little boy who lives out in Saskatchewan where they have great level plains. When he drew this picture he made his sky-line almost straight across it from side to side, for that is the way a sky-

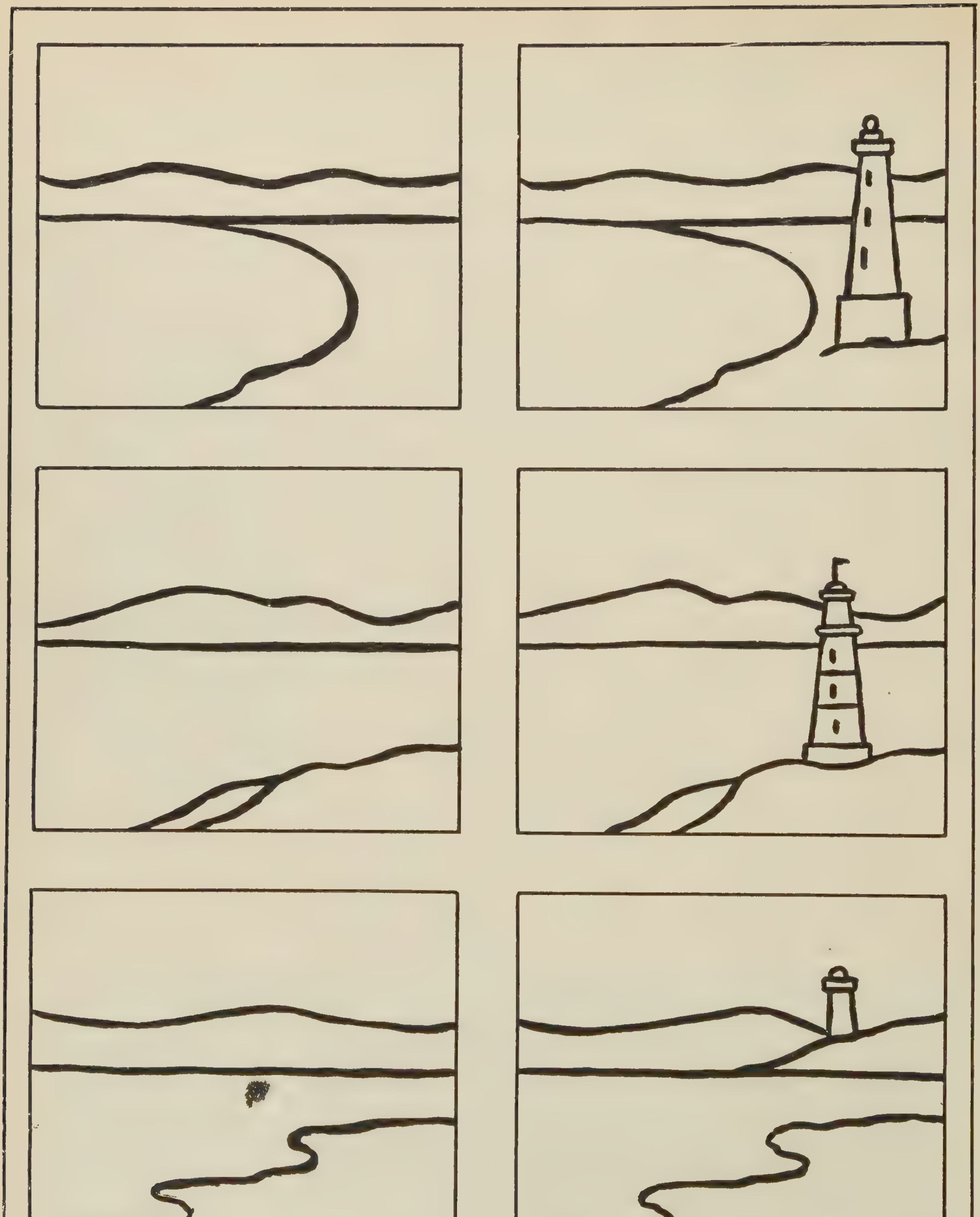


line looks in that kind of country. On this page there is a picture of a tree on a mountain side. You will see how the sky-line slopes. It is much higher on one side of the picture than the other. That gives the effect of the steep mountain. This picture was drawn by the same boy who drew the view of Mount Hood that you see on the Source Picture. In his picture of Mount Hood, the shape of the mountain peak forms the sky-line. Look at the different pictures in this chapter and see just how the sky-line has been drawn in each one. Sometimes you will find it has been drawn high up in the picture. Sometimes it is in the middle of it, sometimes low toward the bottom. Sometimes it is hidden, partly or entirely, by objects like a house or a line of trees in the distance. The pictures that have mountains in them generally have a high sky-line because the mountains make that necessary.



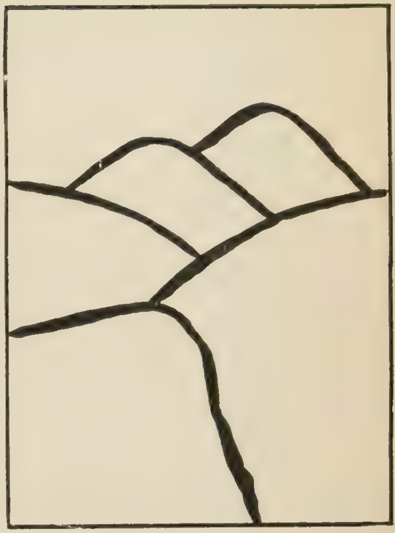
Just as you found that drawing flower outlines was a great help in flower painting, so you will find that planning the outlines of a landscape before you paint it, helps you very much in getting the effects you need. Try practicing the mountain outlines that you see on page 356, and page 357. Draw them with crayons on your drawing board, and invent ways to color them afterwards. One, as you see, is a picture of a volcano. It has the pointed top that so many volcanos have. We could guess what it was from its shape without seeing the smoke curling up from its top. I dare say you have

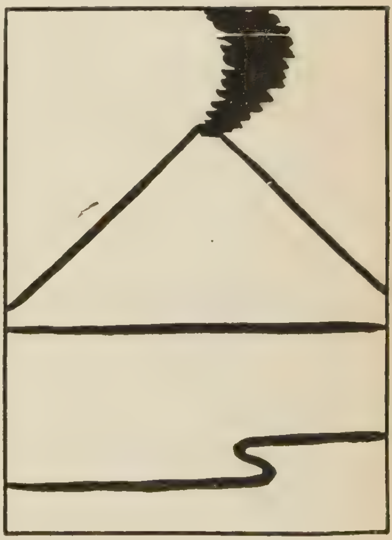


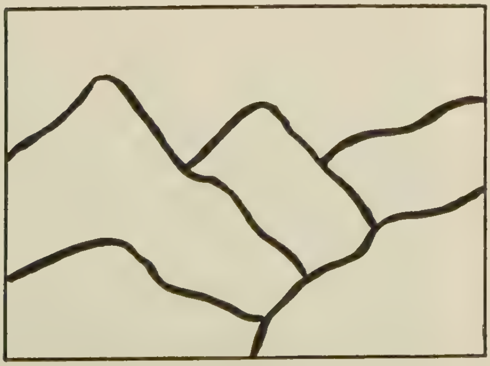


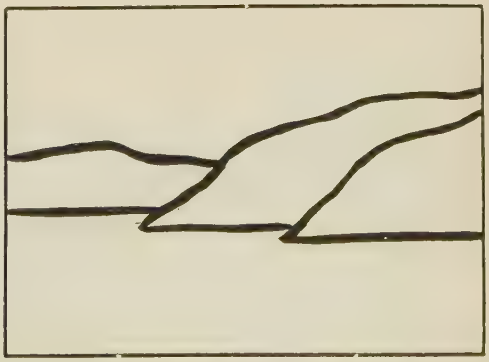
never seen a volcano, but on page 366 there is a picture painted by a boy who sees one every day. He looks out of his window in the Hawaiian Islands where he lives, and across the water, a few miles away, he sees this mountain with its pointed top, and the blue waves of the Pacific Ocean at its base. On page 354 there is another landscape with mountain outlines in it. The boy who painted this picture often sees the clouds coming down over the high peaks near his home in the Rocky Mountains. And he sees fir trees like those he has painted, growing up the mountain sides. If you look carefully at it, you can draw an outline plan that will show you just how he divided his space when he was making this picture. That is an interesting thing to do. Try looking at other people's landscapes and making outline plans from them on your drawing board. It will help you to plan pictures of your own.

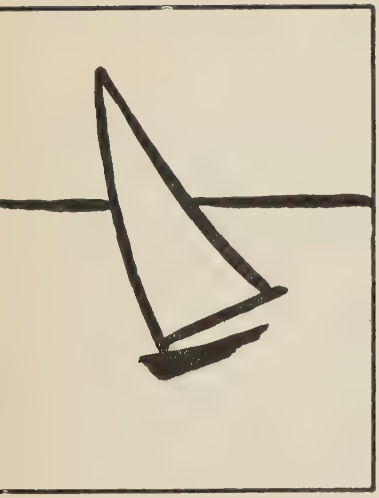
Below the volcano, the line made by the ocean runs very straight from side to side of the page. This is always true of a body of water, for the top of the water is always more level than the land. It may be chopped up in little waves, but as we draw it from side to side of our paper, it should run straight across like the "horizon line" of the sea. The horizon line is the level sky-line that we see on the ocean or on a big body of water like a lake. The sky and water seem to meet, and there are no trees or other objects, no mountains or hills to break the level line made by the water. For

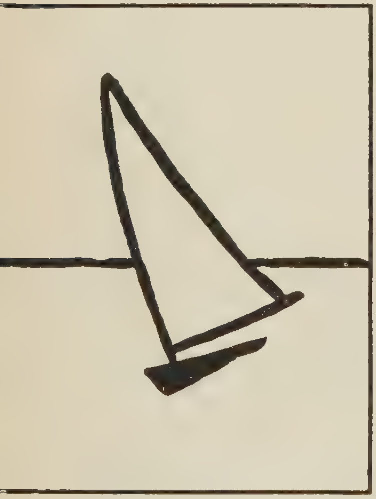








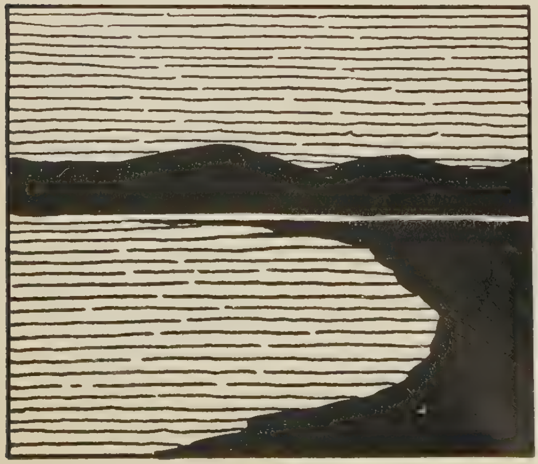


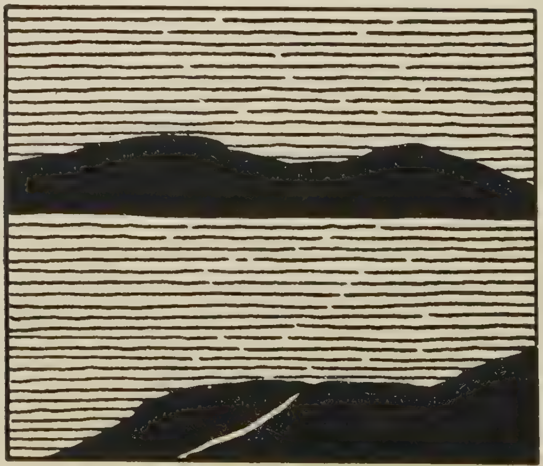


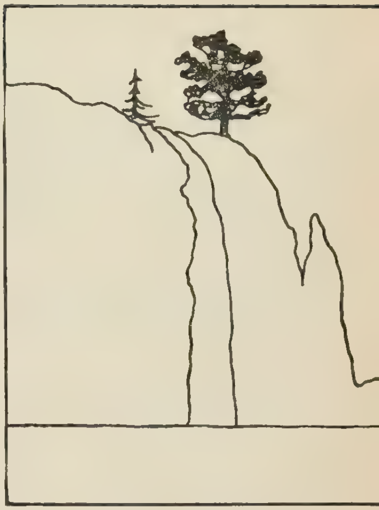
this reason a sea picture can be very simply planned. The horizon line can be placed lower or higher as we choose, and the whole picture divided between sea and sky. Try planning a sea picture with both a low and a high horizon line. Put a boat in your picture and see how the effect changes as you put it low near the bottom or higher near the horizon line.

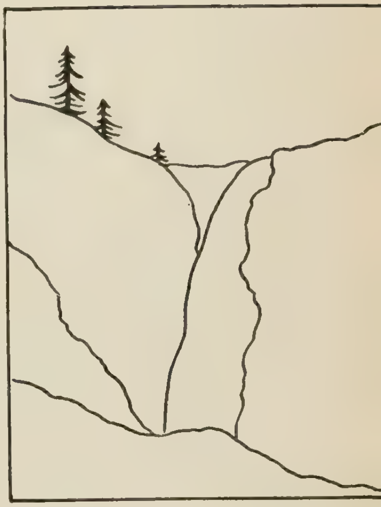
When we draw the picture of a lake, the far away shore line will be level, like the horizon line at sea. It is a good plan to begin by drawing in this straight shore line first. Then we can put in the sky-line above it, making it show a rolling country, hills or mountains as the case may be. The outline of the nearer shore does not need to be level. We may see it curving in front of us in a flat beach, or perhaps with rocks and a steep slant. The pictures at the left side on page 356 show how these shore line patterns can be drawn. The picture of Mount Hood on the Source Picture has the shore lines of a lake in it. The near shore curves, and the further shore is level with the mountain rising back of it. Try drawing the outline on your board, and that of the lake picture on page 363, the one that has the three little pine trees just showing their tops above the steep bank of the nearer shore. It was drawn by a boy who lives in Minnesota.

The outlines on the right side of page 356 are the same as those on the left, but a lighthouse has been drawn in each one of them. You might put boats on the water



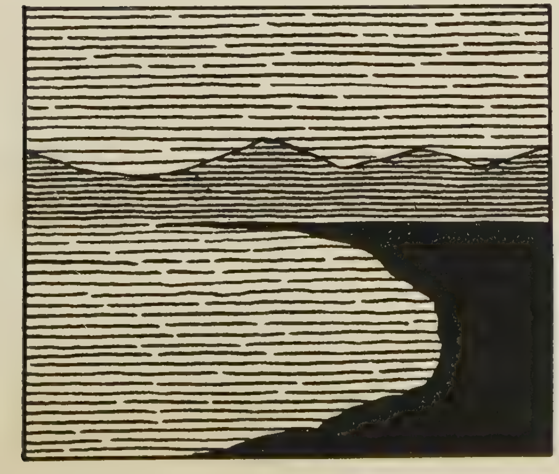


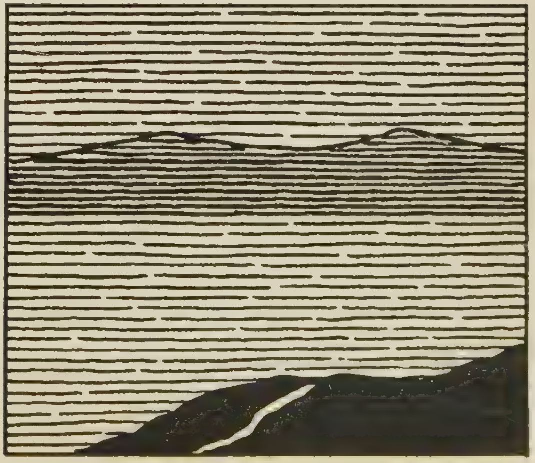


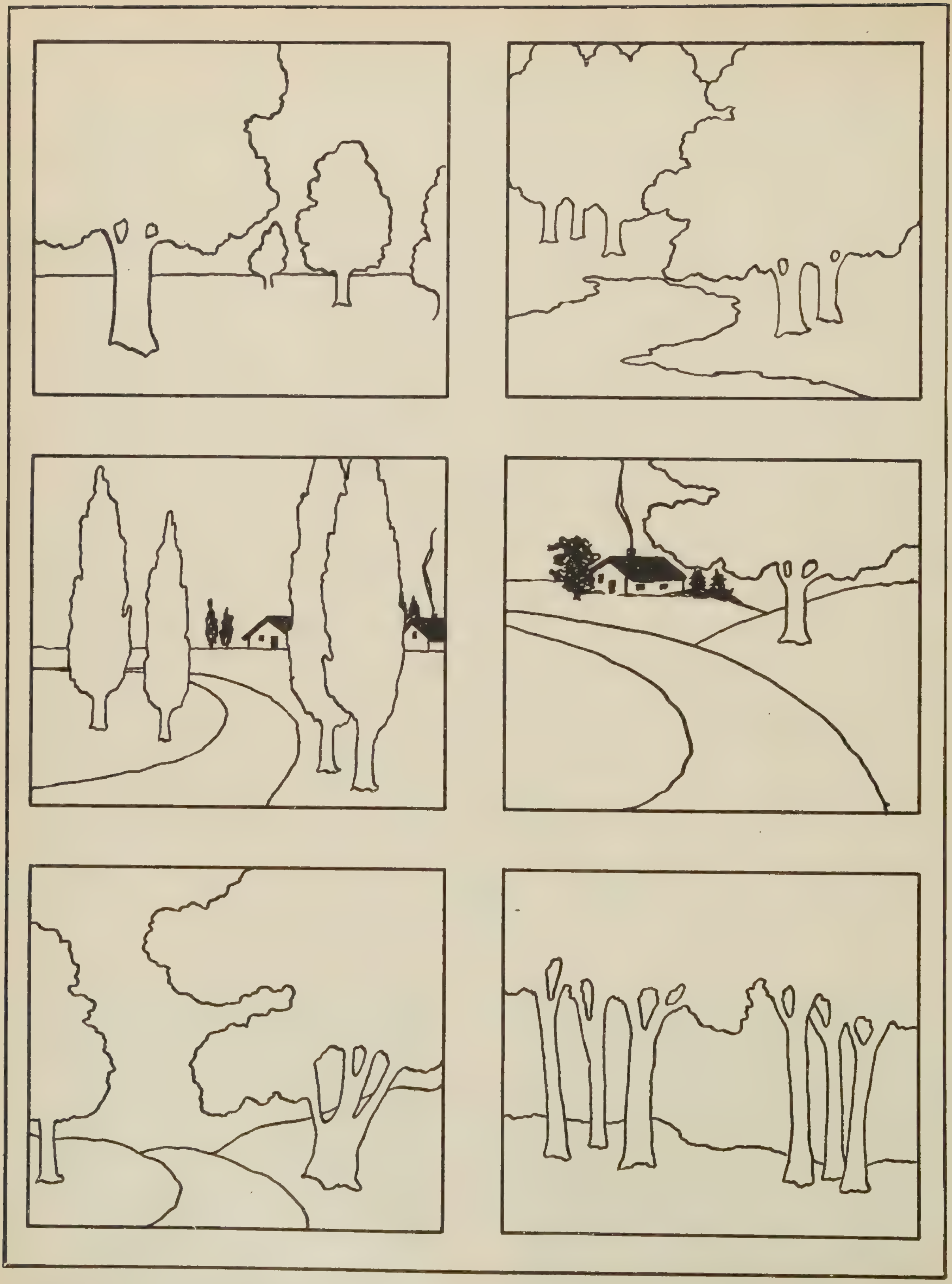


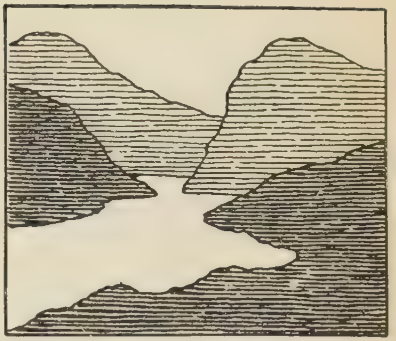
too. At the bottom of page 364 there is a picture drawn by another Minnesota boy. His picture has a lighthouse and a motor boat with a man in it.

On page 358 you will see the shore outlines colored in two values and on this page in three values. Try drawing them in two values on your board. Make the sky and the water blue, and leave the dark green of the board for the shore and hills, or draw the outlines on paper. Make the sky and water blue, and the shore and hills black. You will often see a landscape colored in this way on a poster or in a design. Even when they paint realistic landscapes great artists generally use few values, sometimes four or five, sometimes only three. Try coloring the same outlines in three values. When you do this, make the near shore look darker than the further shore, and color the sky and water in the lightest value. In any daylight picture the sky has always the lightest value. The water, too, if there is an expanse of it as there is in these lake pictures, is light in value. The objects near at hand have the darkest value because they can be seen more plainly. Perhaps you have some kodak pictures that your big brother or some one in your family has taken. Look at one of them, a picture of yourself perhaps, if you cannot find one that happens to have shore lines. You will see that the values in it are the same as in the pictures on this page. In a kodak of yourself, you are darker than the objects behind you. When an artist paints a picture he often looks through

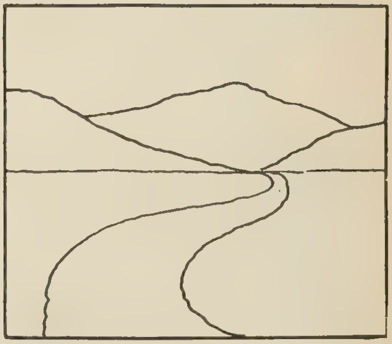






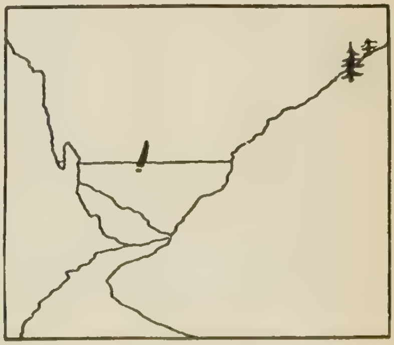


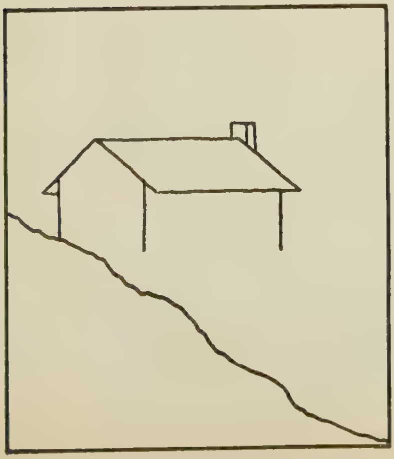
his handkerchief to get the values. If you will do this, you will see that the things near at hand look darker. When an artist speaks of the "pattern" in his landscape he means the way in which he has put in the values, light, middle value and dark. On this page there is a little mountain picture filled in to show three values. On page 359 are the outlines of two scenes, each with a water-fall. Try copying them in three values.

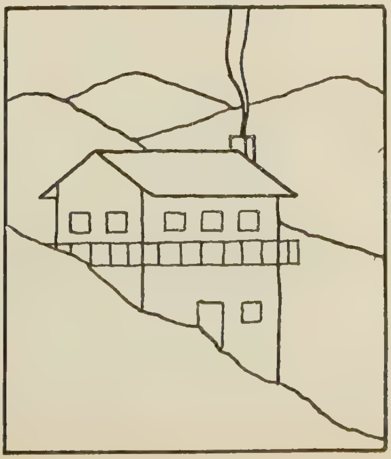


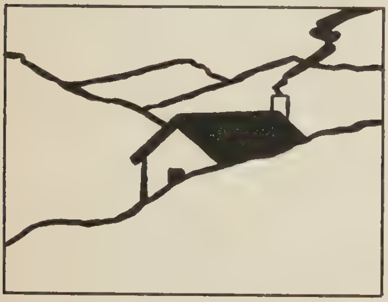
A road or path that starts in the front of the picture and winds away into the distance is a puzzling thing to draw when you first try it. But it is not difficult after you have learned how to do it. There are many different kinds of roads, but all of them must lead somewhere. In a landscape you will find they always lead to the edge of the picture, or to the shore of a river or lake. They are wider near the bottom of the picture, because everything at the bottom of a picture is nearer to the person who looks at it, and things, as you know, look larger the nearer we are to them. On the margin of this page you will find two or three different outline pictures with roads or paths in them. The lines in the first one might be either a stream of water or a road.

When children are drawing a house that is on a hill-side or a mountain side, they often have a hard time making it stand up straight. Have you ever had that trouble? When you are drawing a house remember that the walls must be vertical—that is, straight up and



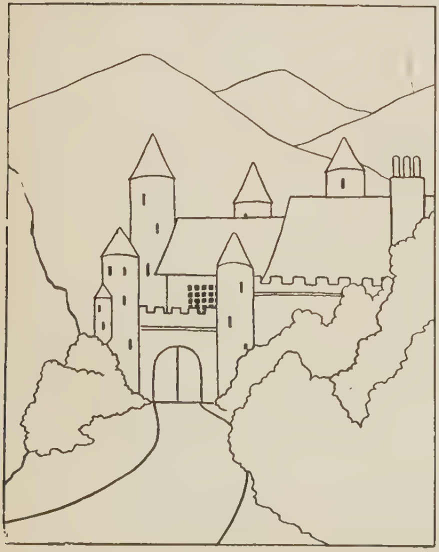


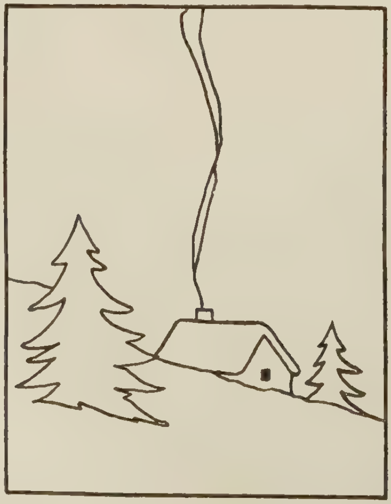




down,—no matter how much the ground on which it is built may slope. It will help you if you watch the side of your paper and use that as a guide when you draw the first line of your house. Then make the other lines look as straight as the first one. The walls of your house must touch the hill at the bottom, and they must also be straight with the edge of your paper. In very hilly countries, houses are often built with deep basements, because of the steep slope of the ground on which they stand. The picture on page 361 shows you the outline of such a house. In Switzerland many are built in that way. Big stones are often put on the roofs, so the winds that sweep down from the mountain tops shall not blow them off. On page 368 there is a snow picture that a boy in Massachusetts drew. He called it "The Happy Hillside." As you see, his house stands up very straight on the top of the hill, in the way it should.

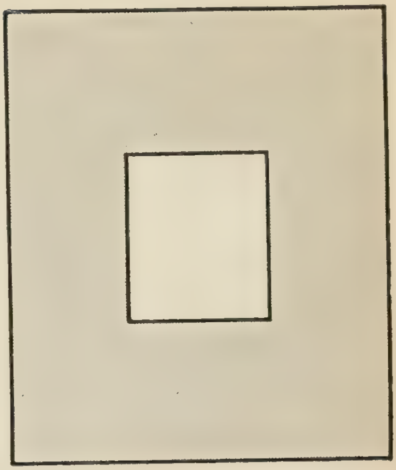
When we put a house in our picture it is not necessary always to put in the whole of it. When little Enid drew her picture, she drew every part of it quite separate from the rest. The house stands all by itself. The tree is all by itself. The flowers between them stand up each by itself in a little row. And this is the way children always draw at the beginning. After a time, however, they find that the house may be partly hidden by the edge of the picture or behind a hill, that the trees often

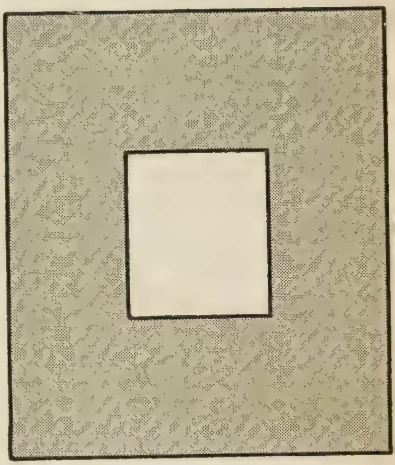


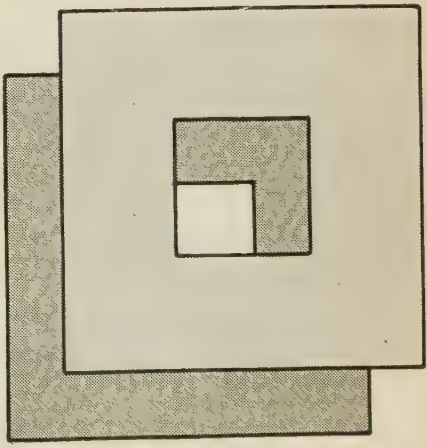


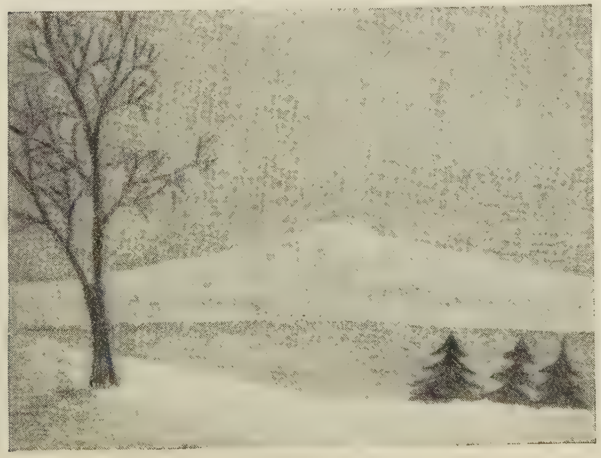
grow so close to the house, we can see only their tops and branches over the roof, or at the side. When you look out of the window of a railway train, or even out of the window of your own room, you often see only a part of the house or the tree that you are looking at. An artist's picture frame is like a window. Often it shows only a part of things. When we are making a picture we can choose just what part of the house, how much of the tree, how many mountain peaks we wish to show in it. Some artists use what they call a "finder" when they are planning a picture. A finder may be just a piece of paper, cut in the shape you intend to use for your picture. It may also be made of two pieces of cardboard like those in the picture on the margin of this page. Then it can be made larger or smaller, square or oblong, as you choose. By holding up the finder and looking through it, you can plan just what part of the landscape before you will make the best picture. By laying it on a big picture, you can find just what part of the big picture could be used for a smaller one. In planning what to put in any picture always remember to fill the whole space that you have for it, and try to fill it in such a way that no part will seem crowded and no part will seem empty. This is a rule for landscapes and for all other pictures.

On page 362 you will see three picture outlines in each of which only part of a house is shown. On page 360



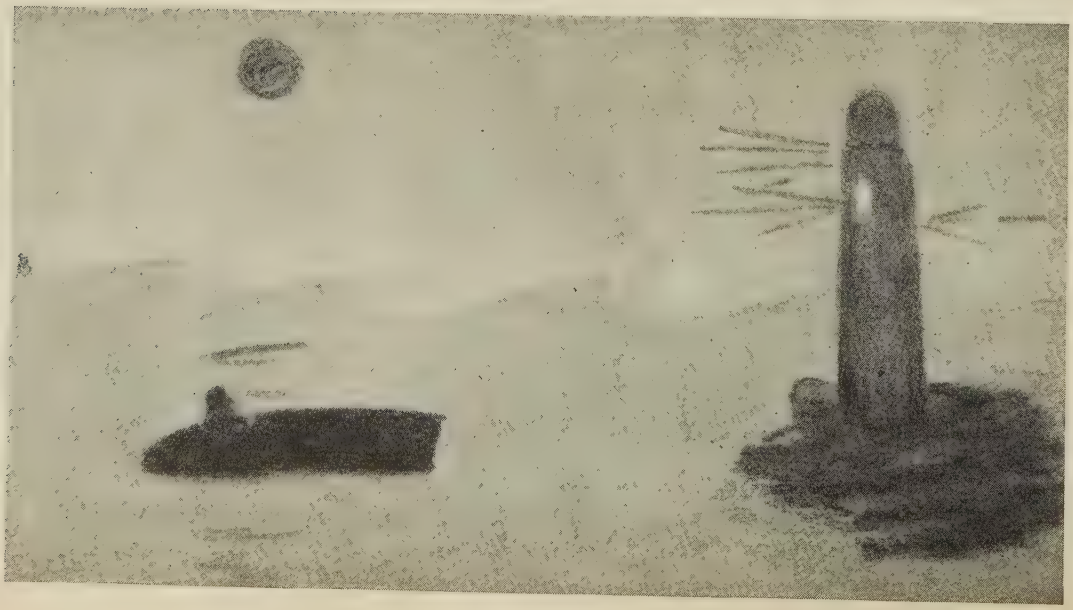






there are some landscape outlines with pictures of trees in them. As you see, many of the trees are only partly shown in the picture. Those that are entirely shown are made smaller and look further away. At the bottom of page 367 there is a picture of some trees painted by a little girl in Missouri. The same thing is true of them. We see only a part of those that are near at hand, and all of those that are further away. Those that are further away look smaller in proportion to the distance at which they are seen.

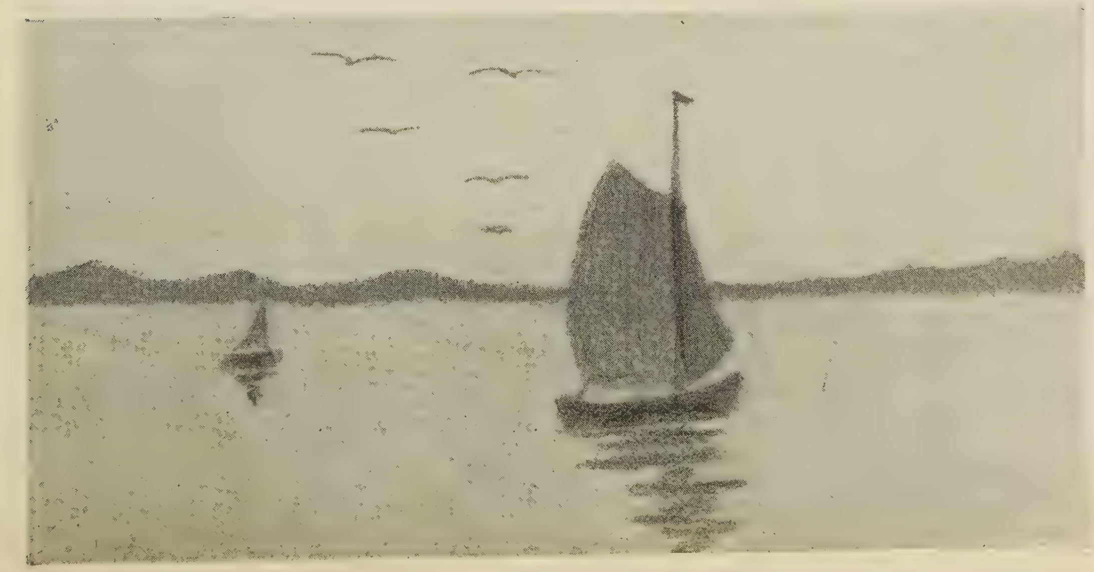
In landscape drawing it is very important to be able to make things look near and far away. It is what people mean when they speak of "perspective." We have already spoken of the way in which a road or a river widens out and looks larger at the bottom of the page. As you look at the trees on page 360, you will see that the larger they are and the closer they look, the nearer their trunks are drawn to the bottom of the page. As they get further away they are set a little higher on the paper. They are drawn smaller and smaller, too, according to the distance at which you are supposed to see them. By experimenting yourself, you can learn a great deal about drawing objects to give the effect of being nearer or further away. It is an especially good plan to experiment with trees. Try drawing different



trees with their characteristic outlines and placing them in different ways in your picture.

Pictures of boats, too, often give us a fine opportunity for practicing effects of near and far away. On this page there is a picture drawn by a little girl who lives in Minnesota. I think she must have seen Lake Superior and remembered it when she was drawing the picture of these boats. The far away boat has been made smaller and placed higher in the picture than the other as you see.

Look at the birds that are flying in her picture. They are big gulls, with their wings spread out just as we have all seen them many times, at least those of us who live near a big sheet of water. There is something especially interesting to notice about them as they are drawn in this picture. Those that are drawn highest on the picture seem nearest to us as we look at them, and those that are lower down are drawn smaller and look further away. For the girl who made the picture knows that, when she draws something in the sky above the horizon line, she must change her way of showing what is near and what is far. The near-by things are still made larger, but they must be put higher on the paper. The far-away things are then put lower down—nearer, that is, to the horizon line. This change will not trouble you after you have practiced a little—not after you



have tried drawing a few birds or aeroplanes, flying through the sky.

Try putting boats and birds in the picture outlines on page 356 and page 357 and making them look nearer or further away. Try coloring them in different ways and experiment in using different values, dark and light or dark, middle and light. It is often important to know how to put a figure in a landscape and even more important to be able to add a landscape background after you have drawn a figure. Try copying the outlines at the bottom of page 362 on your drawing board. Put some boys in the second one. You might leave out the big tree and have them sliding down hill on their sleds. Put in some mountains or hills back of the girl who is skiing. She should be drawn in the darkest values, remember. Her cap, sweater and stockings might be red, and her skis black against the snow.

In a snow picture the values of the earth and sky are changed about. The white earth must be made lighter than the sky. The same is true of night scenes in which the dark sky is darker than the earth, but still not so dark as the objects in the picture.

Important as the drawing of a landscape is, most of its beauty and appeal lie in the color that the artist uses. When we first color our landscapes we think if we make the grass and trees green, the sky and water blue, the houses red or white perhaps, we have done all that is necessary. But soon we begin to see how many differ-

ent greens there are in nature, how many different blues and browns and grays. We see how the greens change and grow yellower when the sunlight strikes them, how blue they are when shadows fall on them. We notice how the far away mountains look. Their colors range from blue to violet as we see them in the distance, even though we know that they are covered with brown rocks or green grass and trees, just like their sister peaks nearer at hand. So we learn to make them lighter and bluer as they get further and further away. Sometimes, too, things look grayer in the distance. A distant line of trees for example, will often look more gray than green or blue. To paint these color changes and make them look real, we need first of all to notice them in nature, and then to experiment with our colors and brushes. Try drawing the mountain outlines on page 357, and making these color changes in the different peaks. Try making the far away shores of the lakes bluer or grayer than the near-by shores. You can make these color changes in the mountains back of the castle on page 362. When you copy the outlines of that picture notice the side of the mountain just behind the castle. As you draw it you will have to imagine it going right

through the castle, or the two sides will not look as if they belonged together.

To be able to draw and paint landscapes is very important to anyone who wishes to be an illustrator, and indeed to any artist. Even the portrait painter often needs to put a landscape in the background of his picture. The artists who specialize in pictures of animals and birds find landscape painting a very necessary part of the work they do. The greatest pictures of the world show us figures of people and of animals, set in beautiful landscapes that are necessary to their meaning and story. On the walls of our homes, and in art museums and public places, beautiful landscapes are a constant source of pleasure and inspiration. Just as the portrait of a face that shines with goodness and friendliness is an inspiration to those who see it, so a fine landscape—really a portrait of Nature's face—is a constant reminder of the wonder and beauty all about us in the world.

CHAPTER XXV

Drawings by Joe Jones

Joe Jones has never been to school. He made the beautiful drawings on Source Picture Number 25 before he had ever had a drawing lesson. He was fourteen years old at the time he drew them. All that he knew then he had learned at home, and most of it he had taught himself, for Joe has never been strong and well. No one ever had a better excuse for not working and accomplishing things than he has had, all his life. But as you see he *has* worked in spite of that, and has accomplished ever so much more than most boys of his age.

As you read in Chapter II, Joe began drawing pictures with his scissors when he was a very little boy. Scissors and paper make a very simple working outfit, yet, just because he can use them so well, Joe could earn his own living with these tools and materials today, if that were necessary. And he *is* earning money and paying for his own drawing lessons with it. For like every one who does things very well, he is anxious to learn more and do his work still better.

Why do you suppose these four drawings of his were made into a Source Picture for your Scroll? They were not put there for you to copy, though perhaps you will like to do that. Copying them, as you know, will never make these pictures your pictures, and it is a far better plan for you to spend your time on something that is really your own. But because Joe has taught himself to use the tools and materials that he enjoys, and has worked with them until he is expert, his pictures remind the rest of us of things that we can do. They remind us, too, that it is what we *learn ourselves*, not what other people try to teach us, that counts. Older people, our parents and our teachers, can help us of course, but only when we are doing the *learning* for ourselves.

Of all the materials and tools described in the different chapters of this book, which are your favorites? Among all the different grown-up people whose work you have heard about, which would you like best to be? There are so many different kinds of work to be done in the world, that we could never name them all, even in a book as large as this one. But when you learn to use tools and materials, and to use them well, and when you finish up each time, and make some kind of a success of the different things you start to make with them, then you are really getting ready to

do your grown-up work, even though you have not yet made up your mind what it will be.

When Joe Jones first began to draw with his scissors, he had no idea of being an illustrator we may be sure. When a friend made him a present of some Hy-San Colors, one day, he was not even sure that he could make good pictures with them. He said so to another friend who wrote and asked him to make some drawings for a prize contest. But he set to work, and not long afterwards he sent the four you see on the Source Picture to the judges, and won the Grand Prize for the one called "The Pioneer."

Joe's pictures tell us a good many things about him. One thing they tell us is that he is well informed. He knows a great deal that he must have learned from reading books. He must have read Huckleberry Finn, for instance, that famous story by Mark Twain. He must have read history as well, or he could never have drawn that picture of "The Pioneer" leading the way across the "Great Divide" and signaling the covered wagons that come after him. It was in the covered wagons, as you know, that the first settlers of the great West travelled to their new homes. "The Great Divide" was the high Rocky Mountain chain that separated the country people knew from the wild country

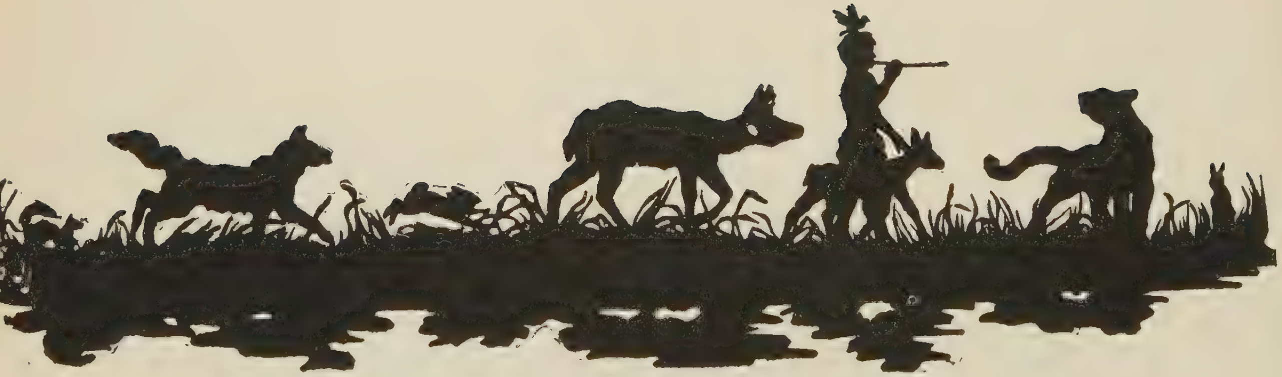
farther to the west. Before people could dare to journey into those unknown parts of America, and take their children with them, brave men had to go on ahead and find the way. Often they travelled for days on horseback all alone. They learned to know the Indians, and they dressed very like them. There were no places near where they could buy new clothes, so they wore shirts of deer skin, and caps made from the fur of the raccoon. They carried their guns every minute, for they never knew when they might meet a wild animal or an Indian who was their enemy. Then, too, they must be ready to shoot any game that they might see, for they could carry very little to eat and had to find their dinners along the way. Joe knows all about these things, and his picture tells us that he does. In it you can see the "coonskin cap" the pioneer is wearing, and the fringes on the sleeve of his deerskin shirt. It was hard, hard work to make the great West a safe and prosperous country. Joe knows that, and he reminds us of it in his picture. He makes us feel what a hard climb it has been to reach that place, where the pine tree marks the road. But now "The Pioneer" has reached it, and he is waving to the people in the wagons. "Here it is," he seems to say. "From this spot you can see the place for which we are bound. Follow me and you will soon be there."

You will not be surprised to hear the judges found it hard to decide which one of the four pictures ought to take the prize. Some of them liked "The Mustang" better even than "The Pioneer." Perhaps you will. When we look at it, it makes us feel that we would like to be that wild horse, and do what he is doing—stretch our muscles, and enjoy ourselves out in the fresh air and the sunshine.

But it is true of all Joe's pictures, that each one puts us in a different mood as we look at it. We see the old horse drinking in the sunset light, and we feel glad that her day's work is over, that she can have her "Playmates," and enjoy the cool water in the trough. We look at Huckleberry Finn and find ourselves watching his fishing line and hoping for a "bite." Did you ever wish you were a monkey in the jungle? I never did until I saw Joe's cut-out picture on page 370. Now I am sure I should enjoy the life. The jungle is so marvelous, so full of wonderful creatures! But perhaps you had rather be the Indian, stealing along under the forest trees in his noiseless canoe, and surprising the great birds that make their homes there.

When Joe makes cut-outs he works "freehand" and

never draws his outlines with a pencil first. Though he makes many pictures of people, he loves animals best and, as you see, he loves to think of them as free and wild in their outdoor homes. He says the boy in this last picture is himself as he would like to be, living like "Mowgli" in "The Jungle Book," with all his animal friends around him.*



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*Since this chapter was written, Joe Jones has died (1930).

THE END

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